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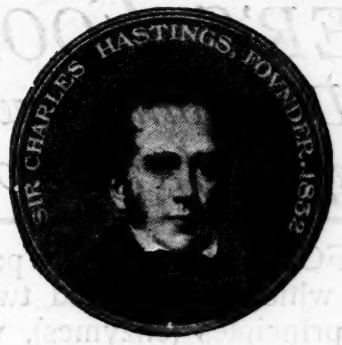

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EIGHTY-NINTH ANNUAL MEETING
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SECTION OF ORTHOPAEDICS AND DISEASES OF CHILDREN.
A. H. TUBBY, C.B., C.M.G., M.S., F.R.C.S., President.

DISCUSSION ON THE EARLY DIAGNOSIS AND TREATMENT OF ACUTE POLIOMYELITIS.

OPENING PAPER
BY
E. FARQUHAR BUZZARD, M.A., M.D., F.R.C.P.Lond.,
Physician, St. Thomas's Hospital.

ALL who are interested in diseases of children must realize the importance of recognizing at an early stage the symptoms and signs which distinguish acute poliomyelitis from the other ailments of infancy and childhood, and the victims of this crippling disease must always look to the orthopaedic surgeon for help in reducing their disabilities to a minimum. The diagnosis of acute poliomyelitis, if it is to be early, must usually rest with the general practitioner, and its treatment is of physico-therapeutic and orthopaedic rather than of medicinal concern. But it may be within the legitimate sphere of a physician to discuss and emphasize certain principles in diagnosis and treatment which have not yet received sufficient recognition, even if he leaves the elaboration of details to those who follow him.

Mistakes in the early diagnosis of acute poliomyelitis have their chief origin in a defective conception of the disease. Until the last fifteen years or so it was usually regarded as a mysterious affection of the nervous system belonging to the province of the neurologist. It was not included, as it should be, among the acute specific fevers, comparable to small-pox, varicella, measles or enteric. As a consequence of this mental disorientation the possibility of acute poliomyelitis rarely entered the mind of a doctor when he was confronted with a child suffering from fever, headache, vomiting and convulsions. He was prepared for and even welcomed the development of a rash which provided the clue to a diagnosis, but he was quite unprepared for the appearance of paralysis. Its onset came as a shock not only to himself but to his reputation as a diagnostician. The diagnosis of acute poliomyelitis is not likely to be made early, therefore, until its place among the acute specific fevers has been firmly established in the mind of the profession.

The teaching of twenty years ago was at fault in another respect, and led to many mistakes in diagnosis. It was generally accepted that acute poliomyelitis was a painless disease. The presence of severe pains in the limbs, increased by movements and handling, complained of by a child suffering from an acute febrile illness, has again and again been responsible for a diagnosis of acute rheumatism, which has not been dispelled until the subsequent discovery of paralysis has disclosed the gravity of the position.

Conversely, the picture presented by an infant under two years of age suffering from scurvy may resemble closely that of acute poliomyelitis. The avoidance of all voluntary movements consequent on the pain they provoke suggests a flaccid paralysis, and only a careful investigation of the condition of the reflexes may enable the observer to decide whether the patient's immobility is or is not due to organic disease of the nervous system. A flaccid paralysis limited to one limb in an infant with an epiphysitis of syphilitic origin may also simulate acute poliomyelitis, and the diagnosis may depend on careful clinical examination, supplemented, if necessary, by radiography. But poliomyelitis is liable to be confused also with other acute infective diseases of the nervous system, such as meningitis, toxic polyneuritis, Landry's paralysis, disseminated or ascending myelitis, and lethargic encephalitis.

Meningitis.

It is not so long since acute poliomyelitis, or acute anterior poliomyelitis, as it was then called, was regarded as a disease confined to the anterior horns of the spinal cord. Modern investigation of acute fatal cases has established it as a more general inflammation of the tissues of the central nervous system in which the leptomeninges, especially those on the anterior aspect of the cord, are almost invariably involved. It is not surprising, therefore, that symptoms and signs which we have come to regard as suggestive of meningitis may be present in the early stages of the disease. Convulsions, vomiting, head retraction, photophobia, and increased resistance to passive movement in the limbs may strongly suggest a diagnosis of meningitis. Examination of the cerebro-spinal fluid is then a matter of great diagnostic importance. In cases of poliomyelitis evidence of some meningeal reaction may be found in the presence of increased fluid pressure and a mild lymphocytosis, but the cellular content is never sufficiently high to give the fluid the turbid appearance so characteristic of most forms of meningitis. Microscopical and bacteriological investigation will serve further to establish the cause of the inflammation in which the meninges have been involved.

Toxic Polyneuritis.

The discrimination between toxic polyneuritis and acute poliomyelitis is of importance especially in regard to prognosis. In neither condition is the mortality rate high, but in the former disease complete recovery from all disability in non-fatal cases is a much more probable event than in the latter. The onset of polyneuritis is usually insidious as compared to that of poliomyelitis and the full development of the disease is longer delayed. Moreover, the symmetry of the paralysis in polyneuritis is in marked contrast to the asymmetrical involvement of the limbs in poliomyelitis. The absence of sensory disorders, except for some tenderness of muscles, may be noticeable in both conditions and examination of the cerebro-spinal fluid may give little information of value. Speaking generally, the initial constitutional disturbances in polyneuritis are less severe than those which are present in cases of poliomyelitis with widespread paralysis.

Landry's Paralysis.

This is a rare disease which generally affects young adults at an age when poliomyelitis is relatively uncommon. Many cases of poliomyelitis in adults have been recorded as cases of Landry's paralysis chiefly because the course of the disease has been of the acute ascending type. In Landry's paralysis there is little or no constitutional disturbance, pain and tenderness are absent, and the cerebro-spinal fluid shows no noticeable changes from the normal. In acute poliomyelitis with general involvement of the muscles there is often retention of urine for a day or two, a symptom which is very rare in Landry's paralysis. An acute ascending paralysis, whether belonging to the Landry's group or due to poliomyelitis, is generally fatal.

Disseminated Myelitis.

The diagnosis of this disease, even when it takes the ascending form, from acute poliomyelitis is not difficult, owing to grave sensory and sphincter disturbances which accompany the motor paralysis.

Lethargic Encephalitis.

There can be no doubt that we are now faced with two infective diseases of the central nervous system, in both of which the chief incidence of inflammatory reaction may be cerebral or spinal. In that disease for which the virus of poliomyelitis is responsible the spinal cord is more often attacked than the cerebrum. But polio-encephalitis and poliomyelitis are not uncommonly present in the same patient, or, in epidemics especially, a certain number of individuals only display symptoms referable to inflammation of the higher centres. Practically all cases of lethargic encephalitis present cerebral symptoms and signs, but a small minority are characterized by evidence of spinal cord involvement as well.

No surprise need be occasioned by the fact that there are many similarities between the bedside phenomena of these two diseases in spite of the fact that experimental, epidemiological, clinical, and even histological investigations have proved them to be quite distinct from one

another. Until some laboratory test is evolved which can determine with certainty and rapidity the responsible virus, cases presenting difficulties in diagnosis must occasionally be met with.

From the etiological point of view poliomyelitis is a disease of infants and children, the incidence rapidly declining as age advances. It prevails chiefly during the summer months, is acute in its onset, and runs its course in a few days. Lethargic encephalitis, on the other hand, attacks impartially persons of all ages. It is more prevalent during the winter and varies enormously in its mode of onset and in the duration of its attack. Although the presence or absence of any particular symptom or sign is insufficient to differentiate the two diseases, seeing that inflammation of any part of the central nervous system is a factor common to both, yet there are certain features in many cases of lethargic encephalitis which are to some extent characteristic. These are lethargy, the mid-brain symptoms, and the involuntary movements and muscular contractions which have drawn so much attention to the disease.

Diagnosis.

It may be asked whether, away from the bedside, there is any method of determining the presence of poliomyelitis before the clinical manifestations of the disease abolish all doubt as to its identity. In other words, can the diagnosis be made at the stage when appropriate treatment would be likely to exert an influence on the course of the inflammatory process in the spinal cord? The answer to this question, it must be confessed, is in the negative. It is true that a serum diagnosis is possible, but the length of time involved in its elaboration renders it of little practical value, and there seems to be doubt as to its reliability in very early cases. The serum from the patient who is the subject of the test is mixed with an equal quantity of an emulsion of spinal cord containing the active virus. A quantity of this mixture, after standing for several hours, is injected into the brain of a monkey at the same time as an equal quantity of the emulsion unmixed with serum is injected into the brain of another animal. Should the latter develop the disease and the former escape, it may be assumed that the serum of the patient possessed some viricidal property. It has been shown, however, that this property is only active *in vitro* and that the injection of serum from a poliomyelitic patient directly into an animal has no preventive or curative effects.

The early diagnosis of acute poliomyelitis therefore still remains largely in the province of the clinician, whose recognition of the disease at the first possible moment will depend chiefly on his having mentally orientated its position among the acute specific fevers, and on his being prepared for paralytic symptoms supervening in a child presenting the characteristic features of that group.

Treatment.

The treatment of acute poliomyelitis may be conveniently considered under three headings: (1) The treatment of the patient who is ill with the disease, (2) the treatment of the patient during convalescence, and (3) the treatment of resulting disabilities.

Before dealing with the first two stages it may be profitable to recall the knowledge we have gained from the examination of fatal cases. The condition of the brain and spinal cord when it is acutely inflamed and while that inflammation is subsiding, the state of the nerve cells and their axons, and the reparative processes which are going on within the nervous system, should never be absent from the doctor's mind, and should influence his management of the patient at every turn. The presence of one or more paralysed limbs must not divert attention from the disease and the healing processes which are running their course, not in the disabled members but in the hidden depths of the nervous system.

What are the outstanding anatomical features of the disease which deserve our profound attention? In the first place it must be remembered that the invasion of the brain and spinal cord is of much greater extent than appears on the surface. I have often been struck by this fact when examining fatal cases. For instance, a patient presenting paralysis of certain limb and trunk muscles dies from respiratory failure. Clinically the incidence of the disease has been on the spinal cord. Histologically there is abundant evidence of inflammation extending throughout the brain-stem and probably into the cerebral hemispheres. Let us recognize, therefore, that the whole of the nervous system has been subjected to an infection only some of the results of which may be manifest.

In the second place we must consider in detail what has befallen the cells of the anterior cornua before we set out on the muscles which they innervate. Take a typical section from the cervical or lumbo-sacral enlargement. The whole mass of grey matter is swollen, its vessels are engorged and its tissues are the seat of abundant serous and cellular exudation, with here and there a capillary haemorrhage. Your critical eye tells you at once that such an inflammation, even under the best conditions, would take weeks to subside, and that the healing process demands rest above all things for its favourable development. Examine each group of cells. You will find some have disappeared finally and irrevocably; others are damaged beyond repair; others again, swollen and with displaced nuclei, may be considered hovering between life and death; while the remainder, few or many, constitute the only real survivors in the midst of the surrounding devastation.

Such a picture gives one food for thought when we are considering how to treat a patient who has passed through the febrile stage of his illness, who has regained his appetite, and who says he feels quite well except that he cannot move his arms or his legs. Handicapped as we are by having no efficient weapon with which to fight the infection, it is only reasonable that every effort should be directed towards assisting nature in the combat. The patient must be nursed with the greatest care, every unnecessary mental and physical effort should be saved him, and this policy of inactivity followed assiduously long after the constitutional symptoms have faded away. But masterly inactivity may be supplemented by more active measures in certain directions. The fever and malaise must be treated on the usual lines, and pain relieved by suitable methods, if necessary by morphine.

In the course of an epidemic it may be worth while trying the effect of an immune serum introduced into the spinal canal if the diagnosis has been made at a sufficiently early stage. It cannot be stated with assurance that this method is of proved value, but some success has been claimed by several observers. For the purpose it is necessary to find someone who has passed through an attack of the disease, who is free from syphilitic taint, and who is willing to give 20 or 30 c.cm. of his blood. The serum is separated, and at body temperature is injected into the spinal theca after removal of a corresponding quantity of cerebro-spinal fluid. Injections of 10 c.cm. may be repeated daily for several days. Obviously the conditions favourable for carrying out this treatment in practice can rarely be met with, and its employment after paralysis has once been established is not calculated to be of any value.

Hexamine is usually given in the acute stage of poliomyelitis, as in other infective diseases of the nervous system, on the ground that it reaches the spinal fluid in the shape of formaldehyde, but it is at least doubtful whether it exerts any beneficial effect.

Retention of urine needs to be met by the use of the catheter, but this complication is usually of short duration. Constipation is common in the early stages, but can be dealt with by means of aperients and enemata. It is apt to be obstinate when the abdominal muscles are paralysed.

If rest is the first essential in the acute stage of poliomyelitis and during the first three or four weeks of convalescence, the posture maintained during this period is a good second. There is no one posture which is applicable to every case, but there is a principle which must decide the question of posture not only of the patient as a whole but of each portion of his body. This principle has been evolved from the knowledge that relaxation of a muscle is an imperative factor in its recovery, and that stretching a muscle is inimical to that desired result. Every case, therefore, needs to be studied in detail, the relative strength and weakness of antagonistic muscles operating on every joint accurately measured, and means adopted to maintain every segment of each affected limb in the position most favourable to recovery and least favourable to the development of deformities. At the same time the paralysed parts must be kept warm and their local circulation and nutrition promoted by rubbing. During these first few weeks it is quite unnecessary to have a trained masseur to

carry out this treatment, and any nurse should be able to do all that is required.

A month or six weeks having elapsed since the onset of the disease the time has arrived when the condition of the patient's musculature should be carefully studied with a view to further treatment. It will now be found that certain muscles previously paralysed have begun to respond to volitional stimuli. They do not present evidence of much atrophy, and they have not lost their response to faradism. These muscles will not give us any cause for anxiety in regard to their recovery. On the contrary, we may find it necessary to control their increasing activity lest by their contractions they may stretch other muscles which have been less fortunate.

A certain number of muscles will be found wasted and presenting the reaction of degeneration. The question of their recovery is one which cannot be answered at this stage, and we must be content to keep them in a condition as favourable for future activity as the circumstances permit. We know that some of these muscles may never contract again at the bid of their owner, that their innervating cells have been destroyed. Remembering the anatomical picture I have described, we realize that other muscles apparently in the same plight have more favourable prospects. Their innervating cells have been badly damaged but not destroyed. In time they may recover their function and be prepared to resume control over the muscle fibres to which their axons are distributed. It is our business to be prepared for this contingency at the end of a period which may be of a year or eighteen months' duration.

How is this time to be employed? We are ignorant of any therapeutic measure by which the recovery of the nerve cell and its axon can be facilitated or hastened, and must therefore be content to maintain the patient's health at the highest possible level. We are more actively concerned with preserving the paralysed muscle in such a condition that the advent of nervous impulses may find it capable of regeneration and without obstacles in the way of performing its natural function.

Experiment and experience has taught us that this end is best attained by keeping the muscle in a position of relaxation, by keeping it warm, by promoting its nutrition and by preserving its contractility. It is with the last two measures that massage and electrical treatment are concerned, and they must be employed regularly and almost daily throughout the period of waiting.

The object of electrical treatment is to make the muscle contract, and it is waste of time as well as harmful to put the affected limb in a bath of water through which an electrical current is passed. Each muscle must be stimulated by the make-and-break of a galvanic current, care being exercised that the latter does not spread to antagonistic muscles the contraction of which would stretch the paralysed fibres.

At the end of eighteen months of appropriate treatment on these lines the patient may be regarded as having reached the stage when any further mitigation of his disablement must depend on artifice or operation. It is to the orthopaedic surgeon that he must turn for help, and, in view of the great advances made in this special branch of surgery during recent years, he will not turn in vain.

R. C. ELMSLIE, O.B.E., M.S., F.R.C.S.,
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DR. FARQUHAR BUZZARD has made such a complete opening to the discussion that there is little left to the followers except to emphasize particular points. I venture to differ from him when he says that early diagnosis is of more importance to the doctor than to the patient. In view of the importance which we now ascribe to rest in the early stages, I think that it is impossible to over-emphasize the value of early diagnosis. Three points in diagnosis have particularly struck me: (1) the frequency of a loose diagnosis of meningitis, without accurate investigation, in cases which turn out to be poliomyelitis; (2) the common diagnosis of "convulsions," without defining what the convulsions are due to; and (3) the occasional difficulty in diagnosis between poliomyelitis and acute scurvy.

Treatment may be divided into two stages: (1) that of rest; (2) that of restoration of function. The stage of rest, I should say, ought to last about six weeks. We should remember that in poliomyelitis there is an acute inflammation in the central nervous system. Following up the old principle of resting all inflamed structures, we should adopt as our principle of rest the avoidance of all active movement and the avoidance of all unnecessary peripheral stimuli. At as early a stage as possible the child should be fixed upon a splint or in plaster-of-Paris, moved as little as possible, washed as seldom as possible. I prefer for this purpose a plaster-of-Paris splint or a plaster bed. To make it necessitates a certain amount of handling of the child, but such handling is no more than that involved in fixing the limbs in plaster-of-Paris. Of the different forms of physical treatment the one of importance at this stage is the maintenance of posture, of such posture as will prevent over-stretching of weakened or paralysed muscles, and will prevent the initiation of contracture and deformity. Massage—that is to say, friction, kneading, etc.—and electrical treatment, are undesirable at this stage, they necessarily involve peripheral stimuli which are undesirable.

After the period of rest, the first essential is still the maintenance of posture. In the restoration of function the most important point is the restoration of active use of the affected muscles by active exercises. It is unnecessary to call upon these weakened muscles to act through their full range and to lift the limb segment against the action of gravity. They should be exercised at first through a small range, without being stretched, and whilst the limb is supported. Moreover, much can be done by using eccentric movements, allowing the muscle to relax slowly whilst the limb is supported.

Dr. Buzzard has dealt sufficiently with electrical treatment; a word must, however, be said about appliances. On the one hand, some surgeons do tend to overload children with instruments to an unnecessary extent without sufficiently careful thought; on the other hand, some physicians desire to discard all instruments, allowing the child to walk about with the limb in any position. Instruments should be used with thought, and every one should serve a definite purpose: (1) to prevent the over-stretching of weakened muscles; and (2) to allow of use of the limb in as nearly as possible a normal way.

In the later treatment massage should not be applied diffusely but thoughtfully to the muscles which require it, and re-educational exercises should be carefully thought out in each case, so that every exercise serves a purpose. One other point requires mention: the maintenance of nutrition. The best way of maintaining nutrition is to bring the affected limb into active use. Other methods, such as special baths and electrical methods, have their uses, but it is difficult to apply them in the case of poor children in their own homes. I have found that the use of a simple prolonged hot bath, which can be given in any home, is as good a method as any.

D. MCCRAE AITKEN, F.R.C.S.,
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I PROPOSE, in the time at my disposal, to confine my remarks to the part that posture plays in the early treatment of poliomyelitis, but must first express my entire agreement with Mr. Elmslie's plea that rest must be absolute, and that no massage or electrical stimulation is permissible in the earlier stages of the disease.

Dr. Farquhar Buzzard has pointed out that it is only after a month or six weeks from the onset of the disease that voluntary power begins to return to some muscles, leaving the state of the others doubtful, and from this stage onwards we work with our eyes open to know which muscles to conserve by keeping them relaxed. Before this stage we must be guided largely by experience of those deformities and disabilities which most commonly come to the orthopaedic surgeon for treatment at a later stage. He has given us a vivid picture of the congested and oedematous state of the affected portions of the spinal cord. As already mentioned, some cells recover life and function spontaneously, others are killed by the disease and are of no interest to the orthopaedic surgeon except at a later stage. It is with the nerve cells that are hovering between life and death that we are concerned.

When I was a person liable to be examined in physiology, I learned that if a group of muscles be excised from a monkey's limb, the corresponding motor cells in the

anterior cornua of the cord undergo chromatolysis and die. The life of the motor cell is therefore partly dependent on the muscle which it innervates. We must therefore be careful not to think of the disease as one of the cord alone; we must think of the motor cell, the efferent nerve fibre, the muscle, and the afferent nerves from the muscle as a working unit, the integrity of whose parts are dependent on the integrity of the whole nerve muscle cycle.

Consider now the state of affairs when the oedema is beginning to disappear from the cord: the cells are beginning to struggle back to life and function, and send very feeble efferent impulses to the muscle. If the muscle is overstretched it makes no response, but if its state of elasticity and nutrition has been conserved by keeping it suitably relaxed and rested, any response it makes, however feeble, initiates a muscle afferent to the cord, which must have a physiological action in assisting to revitalize its recovering motor cell. In pursuance of this idea, and in an attempt to discover how far posture in the acute stage influenced the nature of the recovery, I have tried to get from mothers the exact details of how they nursed their children during the acute stage. Many could give no details, but others who nursed their children themselves reduced their daily ministrations to a routine.

It was in the state of the upper limb that I particularly looked for information, for among the many varied forms of paralysis two particular types occur with frequency: (1) the type in which the muscles of the hand have recovered but there is no power of flexing the elbow; (2) the type in which there is power to flex the elbow, but a dropped wrist and flexed fingers. Either group may be associated with inability to abduct the arm at the shoulder. Comparing these conditions with the stories told by the mothers I found sometimes that the mother explained that after attending to her helpless little sufferer she arranged the child with the arms down by the side with the hands lying on the bed. In this position the flexors of the elbow are fully extended, but the wrist and fingers are left in a relaxed position.

Other mothers gently bent the elbows and crossed the hands over the child's chest, thus relaxing the flexors of the elbows, but letting the wrists get into a dropped-wrist position. There was a definite relation between the occurrence of the two types of paralysis and the routine daily position. I never found any mother who made a habit of spreading out the arms so as to relax the deltoid. As in later stages we find inability to raise the hand to the mouth, to abduct the shoulder, and to rotate the humerus —a condition which prevents the child from feeding itself, fastening its collar-stud, or brushing its hair—I should recommend putting the arms in this position as a routine in the early stages, in order to try to avert some of these very crippling conditions.

Turning briefly to the lower limbs we find the most common contractures are flexion adduction and internal rotation at the hip, flexion at the knee, and a variety of deformities at the foot and ankle which are afterwards much modified by weight bearing. Now a patient with a fractured neck of the femur lies in bed with the limb rotated outwards. How can we account for flexion and internal rotation? If you try to make a patient lie with the knees flexed supported on a bolster—a position commonly used by nurses to make the patient "comfortable" —you will find that the weight of the bed-clothes on the dorsum of the foot is much more likely to rotate the limb in than out. Further, the habit of nursing these cases on water-beds, which allows the hips to sink into the bed in a flexed position, should be abandoned. These patients should be splinted with hips fully extended to relax the gluteus maximus, with the knees straight and the foot carefully moulded into its arched position to relax the tibialis anticus.

Finally comes the question of future growth. The sooner the child is fixed up so as to walk, even if it be with a calliper, the less will be the loss of growth. I had an interesting lesson in this some years ago. A boy, 9 years old, was admitted to one of my cripple hospitals; his lower limbs were flexed, and very small in proportion to his body. It took about six weeks to correct his deformities, and he was then got up on two walking callipers. These splints had to be lengthened three inches in the first four months on account of the rapid growth of the limbs as soon as he began to walk on them.

W. ROWLEY BRISTOW, F.R.C.S.,
Orthopaedic Surgeon, St. Thomas's Hospital.

I WOULD first of all express myself in agreement with Dr. Buzzard and the preceding speakers on the general lines of treatment to be adopted—rest in bed in the acute stage, the stage of pain and illness. Relaxation of the paralysed muscles should be ensured, even in this stage if pain and general symptoms will allow. In the convalescent stage the treatment is conveniently considered under two headings: (1) Treatment by posture, which aims at relaxation of the paralysed muscles, and the avoidance of deformity; (2) treatment directed towards maintaining and improving nutrition in the paralysed limb by (*a*) heat, (*b*) massage, (*c*) electrical stimulation, (*d*) exercises and re-education.

Time does not permit my discussing all these various agencies as aids to treatment, but I would like to focus attention on certain of the physical methods for a few moments. First, what is the rôle of electricity in this connexion? Dr. Buzzard has already covered the ground in about half a dozen lines in his opening paper. Electrical stimulation of the paralysed muscles is employed during the convalescent phase in order to improve nutrition and prepare the muscle so that it may react again to voluntary impulses, if and when the anterior horn cells recover sufficiently. It is the contraction and relaxation of the muscle, with the attendant chemical and circulatory changes which of necessity follow, which we wish to obtain. Stimulation with the interrupted galvanic current will enable us to get this result. No other form of electrical treatment will help us at this stage. Electricity is the stimulus. The passage of an electrical current up or down the nerve will not, so far as is known, affect either the rate of recovery in that nerve or its completeness.

Now the treatment by interrupted galvanic stimulation must be carried out without affecting the posture of the limb, and without causing contraction of the non-paralysed muscles. The method which allows of this most easily is that of using two electrodes placed longitudinally on the affected muscle—one on the muscle belly and one near the tendon. The smallest amount of current which will produce a contraction is used. If no contraction can be obtained in the paralysed muscle, and with increasing intensity of current the spread of this stimulus causes contraction in the healthy muscle, electrical treatment should be discontinued. Preliminary soaking of the limb in hot water will be advantageous in that it lowers skin resistance to the passage of the current. No advantage is to be gained by the use of the "paraffin bath" or the more elaborate forms of water bath such as the "whirlpool."

With regard to the interrupted or faradic current. stimulation is only of use for muscles not completely paralysed, or recovering. Care is needed when faradic stimulation is utilized because a recovering muscle is quickly fatigued by work. It is therefore better to do too little rather than too much with faradic stimulation as with exercise. Indeed the two are the same, at any rate for our present purpose, and faradism should be regarded as electrically provoked exercise and nothing more.

I would strongly endorse Dr. Buzzard's remarks about electric baths. They are always useless, and in many cases actually harmful. This refers to the bath as ordinarily given in which the patient or the limb is immersed and a current—faradic, galvanic, or sinusoidal—allowed to pass through.

Splints maintaining correct posture need never be removed for electrical or massage treatment. The forearm muscles are stimulated with the wrist in dorsiflexion, the deltoid with the shoulder abducted, and so forth. The masseuse, or whoever is carrying out the details of treatment, must be firmly impressed with the absolute necessity of this.

There is one further point which really affects diagnosis and prognosis, and it is this: because a muscle possesses a faradic response it does not necessarily mean that it will recover sufficiently for functional purposes. The regeneration of a few axons will be sufficient to ensure that some fibres will respond when stimulated with the interrupted current—not of necessity sufficient fibres to allow the patient to use the muscle.

The whole question of electrical treatment in dealing with poliomyelitis merits serious consideration in order

that it may be rationally used and its use be based on sound physiological principles. It is a useful aid to treatment. It is not in itself or when combined with massage the whole treatment, but only a part. The subject should be taught—or at least its outlines—in the medical schools, because professional men themselves are often not clear in their own minds as to its uses and its limitations. It is partly in consequence of this and partly owing to the undue optimism of some enthusiasts that the general public clamour for electricity, which they believe is a panacea for paralysis.

I have devoted myself during the time at my disposal to this one point—not that I think for a moment it is the most important part of treatment; it is not; but because its uses and limitations are so ill defined in the literature generally, and because it has a use as part of physical treatment in the convalescent phase of the disease which we are considering.

F. Howard Humphris, M.D., F.R.C.P.Edin.,
London.

Very gratifying have been the results of the use of electricity in this disorder, both by improving the general condition and modifying or curing the resultant paralysis. The earlier the treatment is commenced the better the results will be, and the more readily will they be obtained, and permanent paralysis should be an uncommon result. Our distinguished President once wrote in a chapter on this disease: "By a proper appreciation of the available therapeutical and mechanical agencies we need rarely, if ever, encounter any paralytic deformity."[1]

There would appear to exist some difference of opinion as to when electrical treatment should commence, some advising waiting for weeks until after the fever subsides. The reason for this delay is not clear, and the reason against it is that compression is progressing in the cord and destroying cells and causing paralysis. The time to begin electrical treatment is the hour when the paralysis is first noted, whether the temperature has returned to normal or not. Much good, of course, can be effected at later stages; but the longer the delay the more treatment will be necessary and the chance of complete recovery is proportionately lessened. Few diseases require more care and thought as to electrical treatment than infantile paralysis, and each case must, to a great extent, be judged on its merits; but as a general guide the following scheme might be suggested for treatment. If the patient be seen early and be still in bed, a high candle-power light, followed by a high frequency effleuve or condenser electrode, shou'd be applied throughout the length of the spinal column, this with a view to relieving the congestion and reducing compression of the nerve cells in the cord. A few days later the muscles themselves should be treated to prevent the muscle fibres from atrophying. Here the coarse wire faradic current rhythmically interrupted is excellent. Two sponge electrodes should be used, one at the origin of the muscle involved and one over insertion (sometimes this may be varied by placing one of the electrodes over the motor point). For instance, in treating the peronei, the leg should be supported, the foot flexed as much as possible so as to relax the muscles, one electrode placed over the middle third of the outer side of the fibula, and the other over the insertion of the muscle on the outer side of the foot.

The strength of the current should be the weakest that will produce contraction—three minutes is enough for each muscle, and fifteen minutes should be looked upon as the maximum time for the muscle stimulation, even if several muscles or groups of muscles have to be treated.

Later, when the child is able to leave home and visit the physician, static electricity in the form of the static wave to the back should be used. This current is one of the most efficacious in the whole science and art of electrotherapy. Broadly speaking, the current is applied to the spinal region by means of a metal electrode made of bottle-cap composition (a mixture of lead and tin), or one of lead alone could be used, the essential being perfect apposition. This is connected to the positive sliding terminal of the static machine by means of a copper wire, the negative sliding terminal being similarly attached to a good earth connexion. The terminal balls are slowly drawn apart and sparks allowed to flow between these terminals, forming a spark-gap which should be increased to the toleration of the patient; the muscles underlying the electrode contract during the intervals between the sparks at the spark-gap, the size and vigour of the contractions being in direct proportion to the length of the gap and in inverse proportion to the area of the electrode. It is, of course, impossible to give all the details of the treatment in the short time that I have at my disposal.

The rationale of the current seems to me that it relieves the deep-seated congestion, and Dr. Farquhar Buzzard has given us a picture of the congestion which might have been drawn by a special pleader for the use of the high candle-power light and the static wave current. As he says, "the whole mass of grey matter is swollen, its vessels are engorged, and its tissues are the seat of abundant serous and cellular exudation." Such is the picture drawn in electro-therapeutic textbooks as an indication for these two methods of treatment. With the filling of the capillaries by the action of the high candle-power light a depletion of the deeper structures follows. The engorgement is removed, and there is a tendency to the promotion of normal circulation. The pathology as laid down makes it even stronger for the use of the static wave current. This current induces physical activity. It causes tissue contraction, not only the contraction of surface structures which can be seen, but also of the deeper ones below. These contractions so produced vary from a coarse muscle to the finest cellular and protoplasmic changes of form. Therefore it is not difficult to understand why it should improve conditions of faulty metabolism and lessen and remove the stasis and exudation described by Dr. Buzzard. As he says, there are certain cells damaged beyond repair, others may be considered as hovering between life and death. It is these latter, with the pressure being removed, which will tend towards life, and those cells not yet in danger will not become imperilled from the threatened increased congestion.

There should be no pain caused to the patient, and he should never be frightened or made tired. It is unfortunately not always that the disease is attacked from its onset, and it happens that the patient is not seen until the paralysis has been existent some time. Here static electricity should be employed as soon as the patient is seen, both to spine and possibly to the muscles at fault, or perhaps these latter may be left to a carefully educated mother to attend to at home with the faradic apparatus.

The counsel of perfection is that very early in this disease the static wave current should be applied to the spine, even in the first week of the disease if possible, so that atrophy of the spinal cells may be averted. The current should be pushed to the toleration of the patient, and it is wonderful to see how long a spark these little patients will stand when they get used to it. Great gentleness and some coaxing and much patience will be needed to get the child accustomed to the static machine; but it can be done and the reward is great. In the absence of a static machine muscle stimulation should be obtained by the interrupted galvanic current in the ordinary manner, the electrode being applied as with the faradic battery. When, however, the muscles have sufficiently recovered to respond to faradism that current should be substituted for the galvanic current. Precautions, already mentioned by Dr. Buzzard, as to antagonizing muscles must be taken, whatever form of electrical stimulation is used.

Mr. Elmslie advocated absolute rest for six weeks, perhaps in plaster, with no handling, no electrical treatment; but during this time, if we give this rest and withhold treatment, those "swollen cells hovering between life and death" are being contracted out of activity and their function destroyed. They are not given that chance of life which stimulation of the circulation by the means I have described would give them. With great diffidence, but based on personal experience, I submit that the whole theory of the treatment of stasis by rest is open to doubt, whether it exists in a sprained ankle or in the disease under consideration.

Mr. Bristow stated that where no response could be obtained to the galvanic current electrical treatment was useless; but is it not possible that the galvanic current—liberating as we believe it does hydrogen ions within the muscle structure—may improve or maintain the nutrition

[1] Tubby and Jones. *The Surgery of Paralysis*, p. 41.

of the muscle? Considering how small our knowledge of electricity really is, and if it be the only agent which has any chance of doing good, would it not be worth while to persevere just a little longer than after the moment when the muscle fails to respond to the galvanic stimulus?

I do not wish to be taken as saying the treatment of anterior poliomyelitis should be purely electrical; muscle education and massage are of great importance. Dr. Henry Frauenthal, an eminent orthopaedic surgeon of New York, in whose clinic may be seen some of the most astonishing and brilliant results, once told me that the percentage of good accomplished from the different agents he used would be: electricity about 55 per cent.; muscle education with mental concentration on the physical effort, 25 per cent.; and 20 per cent. from muscle stimulation by massage.

The question is often asked, Up to what stage in the disease is it worth while to attempt to restore muscular function? It has been said that muscles which will not respond to faradism are unlikely to recover. But this is far from a safe prognosis, and so long as muscle tissue persists, so long as it is not replaced by fibrous tissue, other conditions being favourable, treatment may be persisted in and hope may be encouraged.

W. J. TULLOCH, O.B.E., M.D.,
Lecturer in Bacteriology, St. Andrews University.

WHILE I fear I can add but little to the discussion, I should like to give a word of warning concerning the hope—remote perhaps—held out by Dr. Farquhar Buzzard, that the laboratory may assist in the early diagnosis and treatment of anterior poliomyelitis. In the present state of our knowledge of the ultra-microscopic viruses the laboratory is not in a position to assist materially in arriving at a definite diagnosis, though it may aid indirectly by excluding other conditions which may be confused with the malady under consideration.

In the matter of treatment, too, I fear that we as laboratory workers can do but little. So far an adequate serum has not been elaborated, and the employment of serum from convalescent cases is bound to be of but limited application. I would point out, however, that an adequate serum, could this be prepared, might prove of great value by reducing the inflammatory disturbance, lessening the time during which the nerve cells are exposed to pressure from oedema, thereby reducing to a minimum the irreparable changes that are manifested as permanent paralyses. It should be noted that such a serum will not eliminate, though it may limit, paralysis, for the diagnosis of the disease can only be made with certainty at a stage of the infection when neuronophagia has already taken place.

For these reasons, and in view of the work of American investigators, who show definitely that the reservoir of infection in this disease is the upper respiratory tract of contacts, I feel that further laboratory research should be directed mainly to the prevention of the disease.

H. BROOKER MILLS, M.D.
Philadelphia.

DR. BROOKER MILLS stated that in the United States there were 24,000 cases of this disease in 1916; only four States escaped. It was said to spread along the lines of travel; against this was the fact that the New Jersey epidemic of 1907 did not reach Philadelphia, while during the epidemic of 1910 in Washington and a smaller one in Philadelphia at the same time, Baltimore, which lies between them, practically escaped. It was said to be a summer disease; but one of the worst epidemics ever known was in Norway in mid-winter. It was said, too, that epidemics rarely recurred in the same place within two years; but against this were the recent cases in Lancaster and Newcastle. Poliomyelitis, again, was believed to be spread by contact; yet more than one case in a family was rare, and stray cases were more often found in scattered country districts than in cities. Because it was fifty times more common in children than in adults milk had been suspected; but the charge was not proven. Stable flies, too, had been strongly suspected of carrying the infection; but this had since been disproved. The value of quarantine was shown by the fact that among 28,000 children in institutions in New York in 1916, where no visitors were allowed and no new patients admitted, only two developed the disease, and both of these had come in contact with the outside world. Dr. Brooker Mills then quoted the following instance as showing how small a part hygienic conditions played in the spread of this disease:

Barren Island, situated in Jamaica Bay, is a place to which all the city garbage is brought by boat. All the city's dead animals, often two or three thousand a day, are brought there; it has no public water supply, no sewerage system, the houses have no cellars, no garbage collection, and the people have few garbage cans, the household waste being thrown on the ground about the shanties. There are 17,000 people on the island, 350 of them being children, but there was no case of poliomyelitis on that island all summer. Smells, flies, and insanitary conditions have prevailed, but because of its geographical position and the social condition of its people the island is more or less isolated. While not a case developed from these conditions, had an infected person gone to the island an epidemic would doubtless have started that would most likely have produced hundreds of cases.

Early symptoms were irritability, fever, loss of appetite, bowel disturbance (usually severe constipation), extreme sensitiveness of skin, drowsiness, sore throat, headache, profuse sweating, vomiting, and (later) loss of motion of some part of the body. The mildest cases often resulted in the most marked paralysis. The ultimate outlook for any case, as to life and amount of paralysis, was always doubtful, but the younger the child the higher the mortality.

Preventive treatment consisted in prompt isolation of suspicious cases; screening of houses; cleansing of nose and throat; removal of diseased tonsils and teeth; daily bowel action. Any dead or decayed material placed in the ground should be buried more than 4 ft. The colour blue should be used about the house as much as possible because of the fly's dislike for this colour. Other measures were intelligent quarantine, hospital treatment of patients, and muzzling of the press.

HARRY PLATT, F.R.C.S.,
Orthopaedic Surgeon, Ancoats Hospital, Manchester.

THE correctness of the early treatment by full and complete physiological rest to the spine cells and to the locomotor system cannot now be controverted. One of the most disabling conditions encountered in the late stage is the flexion deformity of the hips; this offers considerable difficulties in surgical treatment. For this reason, in the early stages, the position of rest should include fixation of the lower limb and spine with the hip-joint in hyperextension. This is accomplished most easily by the use of a Bradford gas-pipe frame. It has been suggested that electrical methods of treatment should be applied from the day of the onset of the paralysis. Such treatment is entirely empirical, and its wide advocacy cannot, in my opinion, be too strongly condemned.

A. E. MORISON, O.B.E., F.R.C.S.Edin.,
Honorary Surgeon, Hartlepool Hospital.

THE question I would like to raise is whether in cases of acute poliomyelitis the surgeon should not be called in earlier. Surgeons know from experience during the late war that the degree of paralysis or disability resulting from head injuries, especially hernia cerebri, depends upon the rapidity with which the swelling and oedema of the brain due to sepsis is got rid of. It has occurred to me that much destruction of the nerve cells in the cervical or lumbar enlargements of the cord might be saved by trephining over these areas, and thus relieving the oedema due to organismal infection that is present in the cells of the anterior horns.

L. A. PARRY, M.D., F.R.C.S.,
Senior Surgeon, Royal Alexandra Hospital for Sick Children, Brighton.

I THINK a box splint to secure rest in the early stages might well take the place of the plaster-of-Paris splint and bed suggested by Mr. Elmslie; it can be readily and rapidly obtained, and is surely more convenient. If we accept as a principle of treatment absolute rest of mind and body from the very onset—and I for one do this unhesitatingly—I should like to insist on the very great importance of skilled nursing. You have generally a young child with an acute illness, and it is necessary

to keep this child perfectly still and its mind as little as possible disturbed, for a period of perhaps six weeks. For this purpose a really skilled nurse, who is patient, tactful, and who can keep the child quiet, still, and free from worry and anxiety, is absolutely essential.

A last point is that the orthopaedic surgeon who can invent a new walking instrument without the many disadvantages which the best of those now in use possess, will be conferring an enormous advantage on these unfortunate patients.

Reply of Opener.

Dr. FARQUHAR BUZZARD, in replying, remarked on the general unanimity among those who had taken part in the discussion in regard to the importance of rest in the early treatment of acute poliomyelitis. The only exception taken was by Dr. F. H. Humphris, who gave a lurid picture of a child in the acute febrile stage of this terrible disease being subjected to wonderful lamps which were going to stop the inflammation in the depths of the spinal cord, and to spark waves from a static machine which would do incredible feats in the way of preventing degeneration of muscle. If this was to be the early treatment of acute poliomyelitis, the later the diagnosis was made the better, in the speaker's opinion, for the patient.

SECTION OF MEDICINE.

Professor THOMAS BEATTIE, M.D., F.R.C.P., President.

DISCUSSION ON ASTHMA AND ALLIED DISORDERS.

OPENING PAPER

BY

Sir HUMPHRY ROLLESTON, K.C.B., M.D.,

Emeritus Physician, St. George's Hospital; Senior Physician, Victoria Hospital for Children, S.W.

THE conditions allied to asthma, in that they are manifestations of hypersensitiveness and members of what Dr. John Freeman[13] has happily called the toxic idiopathies, are probably numerous, but with the present limitations of our knowledge it is certainly wise not to spread the net of an attractive hypothesis too widely. The following may be accepted: Hay fever, urticaria, angioneurotic oedema, Henoch's purpura, eczema and acute dermatitis, and some forms of acute gastro-intestinal disturbance; some cases of croup have been referred to this cause by Talbot.[45] Doubtful examples are migraine, epilepsy, cyclical vomiting, and, I am tempted to add, gout. In opening the discussion I propose to speak largely but not exclusively of asthma, and shall not discuss the hypersensitiveness to certain drugs as its mechanism is probably the formation of a new foreign protein.

Ten years ago the late Dr. G. A. Gibson[14] introduced in this Section at the Birmingham Meeting of the Association a discussion on the varieties and treatment of asthma, which overflowed as a vigorous correspondence, especially on "cardiac" asthma, into the pages of the JOURNAL for several months. In this interval of ten years our conception of the pathogeny of asthma has undergone a radical change; at Birmingham asthma was regarded as a reflex neurosis, and the sole reference to the present-day opinion was contained in Gibson's introductory address:

> "Many of these cases (for which no cause can be found) manifest a rhythm or periodicity, as if some chemical material were stored up in the nervous centres and exploded at the end of a latent period. It is possible that modern theories of anaphylaxis may, in the future, aid us in our understanding of the reasons which lead to the perpetuation of such a rhythm."

It is no doubt easy to be wise after the event, but the exciting causes of asthma, such as the emanations of animals, were so well known to physicians of the past, such as Salter who also recognized the asthmatic tendency, that we wonder why they did not think as we do, and indeed it is possible that some of them very nearly did, although with a different terminology. But however this may be, the suggestion made independently by Langlois[23] and by Wolff-Eisner in 1906 that hay fever was anaphylactic in nature, and S. J. Meltzer's[31] paper in September, 1910, "on bronchial asthma as a phenomenon of anaphylaxis," though almost unnoticed at the Meeting in 1911, have been followed by a change of opinion which may possibly be too exclusive; thus, in a very recent work on medicine, J. L. Miller[32] defines bronchial asthma as "An anaphylactic manifestation characterized by recurrent attacks of paroxysmal dyspnoea, due to spasm of the bronchioles, developing as a result of exposure to a foreign protein to which the individual is sensitized," and considers that nasal polypi, which might still be thought to act reflexly, excite asthma by favouring the growth of bacteria or possibly by the new growth acting as a foreign protein. From the other point of view, Sir James Mackenzie,[28] in his recent edition of *Symptoms and their Interpretation*, in which he insists on the principle that the vast majority of the symptoms of disease are disturbances of normal reflexes, maintains the frequency with which asthma is the outcome of reflex stimulation from the nasal cavity and other parts of the body; he also regards "cardiac" asthma as clinically similar to spasmodic asthma and due to an insufficient supply of blood to the respiratory organs. But another and more attractive interpretation of the nocturnal attacks of dyspnoea, called "cardiac" or "renal" asthma, is put forward by Sir Thomas Lewis[24] and his co-workers[25] to the effect that the phenomena are due to a non-volatile acidosis caused by defects in renal function, and that the blood may be so suddenly invaded by acid products and in such amounts as to endanger life. Vagotonia or excessive excitability of the vagus and parasympathetic was regarded by Eppinger and Hess as especially well exemplified by asthma; more recently Lian and Catha'a[26] have supported this on the ground of exaggeration of the oculo-cardiac reflex in asthma, and Curschmann[11] believes that the ductless glands by increasing vagotonia favour the production of asthma. Alexander and Paddock,[1] however, found in 20 cases abnormal sensitiveness of the two opposing divisions of the involuntary nervous system, in other words, both vagotonia and sympatheticotonia. Walker[47] considers that although neurotic conditions are often associated with asthma they do not deserve a place as a genuine cause, and that though cardiac and renal patients may have true asthma these are entirely independent coincidences. Dr. Hurst[20] has recently given a much more inclusive definition of asthma as the reaction of an over-excitable bronchial centre to blood-borne irritants and to peripheral and psychical stimuli.

Leaving aside the cases of "cardiac" and "renal" asthma, are we in a position to exclude a reflex explanation of some cases of asthma and to consider that they are all due to hypersensitiveness? This is the first question that I would suggest for discussion. Among the cases of asthma which do not give a positive skin reaction a large proportion are those arising comparatively late in life and associated with bacterial infection of the bronchial tubes (asthmatic bronchitis); now even if a vaccine does good it might be interpreted to act by merely removing a reflex cause—bronchitis. On the other hand, a reflex cause of asthma, such as intestinal worms, may really be due to sensitization to a foreign protein derived from the worm. The precipitation of an attack by smelling an artificial rose is difficult to explain on any grounds other than psychical stimulation.

Etiology.

Heredity.—The importance of heredity is universally acknowledged in asthma and the allied conditions.

Out of 504 cases of sensitization of various kinds Cooke and Vander Veer[9] obtained a history of some form of idiosyncrasy in 244, or 48 per cent.; among his 150 cases of asthma Rackemann[36] found that 27 per cent. had such a history; of Schloss's[42] 80 cases of sensitization 47, or 59 per cent., showed heredity; and of Talbot's[45] 28 cases of asthma 62 per cent. gave a family history of sensitiveness. Heissen[18] of Rostock, however, is exceptional in reporting only 8.5 per cent. in 91 cases.

It is probable that heredity is much more often present than available figures indicate, for a parent without any clinical symptoms may transmit a tendency to sensitization derived from his ascendants, and in such cases the history may well appear negative. The hereditary influence is more often shown as a sensitiveness to several different proteins than to a single protein, as in the case of artificial sensitiveness; in other words, the descendants exhibit a protein sensitiveness but not necessarily of the same kind as the ascendants. The hereditary factor recalls that of gout—a disturbance of protein metabolism. There may be a sensitization to groups of proteins, and

Longcope[27] has made a classification on these lines of cases reacting to (1) the serums of animals, (2) the eggs and serums of fowls, (3) the extracts of shell-fish, and (4) the protein of plants. A broad view of the influence is taken by Hurst,[20] who considers that in some cases an irritable bronchial centre, in others a toxic idiopathy, and in some again both these factors, are inherited.

Heredity and the Age of Onset of Symptoms.—From an analysis of 500 cases Cooke and Vander Veer[9] found that the more marked the hereditary influence the earlier the symptoms appeared; thus in 44 cases with both paternal and maternal inheritance the highest percentages of cases occurred within the first five years of life, in cases with inheritance from one parent only between the ages of 10 and 15 years, and in cases without any family history between the ages of 20 and 25 years. Though it may apparently be present from birth, sensitiveness may take some time to develop, and in the infants observed by Blackfan[4] and by Schloss[41] the time thus taken was estimated. It is easy to imagine that such a delay might be much prolonged, and this contingency should be taken into account in considering the view that sensitiveness is acquired *de novo* in later life. Further, when appearing early this liability to protein sensitiveness has a special tendency to become multiple as time goes on; and a sensitiveness manifested in one direction—for example, eczema—in infancy may be succeeded later by sensitiveness in another direction, such as asthma.

Acquired Hypersensitiveness to Proteins.—In a number of cases of asthma arising for the first time late, or comparatively late, in life it is natural to assume that this hypersensitiveness has been acquired and has not remained latent. Further, in other allied conditions of hypersensitiveness, such as urticaria, the history may show that the hypersensitiveness has only lately become evident. Constant contact may appear to induce hypersensitiveness—for example, in bakers, from inhalation of flour; out of 11 patients who became sensitive to protein after the age of 40 Walker[47] found that four were bakers who reacted to wheat protein. Rosenbloom[39] records the case of a man, aged 44, who had been a baker for twenty-six years, and for fourteen years had suffered from chronic bronchial asthma; he was tested with no less than 113 proteins, including eleven of bacterial origin, and gave positive skin reactions to the proteins of rye and wheat only, the significant point being that these were the ones with which he was constantly in contact. Experimentally guinea-pigs have been rendered sensitive to foreign protein given by the mouth (Rosenau and Anderson, Wells, Schloss); and there is reason to believe that, although the intestinal mucous membrane of normal infants is impermeable to undigested foreign protein, this protection is impaired in abnormal conditions of the alimentary canal (Schloss and Worthen[42]).

Schloss[41] mentions two infants in whom subsequent sensitiveness to egg albumen and milk was ascribed to their administration during diarrhoea.

Open wounds on the surface of the body and lesions of the mucous membrane of the alimentary canal have also been thought to allow foreign protein to enter the circulation in an unaltered condition and so to induce hypersensitiveness. On the other hand, ulcers of the gastro-intestinal tract are common and asthma a very infrequent sequel, and though horse serum was at one time given by the mouth for peptic ulcer, and also applied to chronic ulcers of the leg, to accelerate healing, I have never seen or read of serum sickness or other manifestations of protein sensitiveness in these cases. Some additional factor would appear to be necessary, and it may be suggested that this is an underlying though latent natural hypersensitiveness, and that it is improbable that sensitiveness arises *de novo* from absorption of foreign protein through an abraded or ulcerated mucous membrane.

After infections—especially influenza, though very likely merely because it is the commonest—hypersensitiveness to some protein becomes manifest; this may be ascribed to some residual bacterial infection and to the absorption of the foreign protein thus provided. It is also possible that the infection so alters metabolism in the liver and elsewhere that protein bodies of so abnormal a character as to be "foreign" are produced. The hypothesis of acquired hypersensitiveness due to metabolic changes initiated by infection is open to the criticism that after all this sequence is seen in only a very small minority of sufferers from infections and that the reason why these are affected is that they were latent or slight cases of hereditary hypersensitiveness. Gouty persons are subject to many idiosyncrasies, and although the manifestations of gout usually occur in middle or advanced life, this disturbance of protein metabolism is notoriously hereditary.

The speculation that some cases of asthma not otherwise explained may be related to the status lymphaticus, usually regarded as an inborn defect, though Dr. Cameron[5] argues that it is due to chronic infection, may be mentioned. Alexander and Paddock[1] noted the frequency of status lymphaticus in their twenty cases of asthma. D. Symmers[44] ascribes sudden death in status lymphaticus to an anaphylactic reaction due to sensitization by the repeated liberation of nucleo-protein from necroses in the germinal centres of the lymphatic glands. It is at any rate conceivable that some instances of metabolic asthma are due to a similar though slighter process of auto-sensitization. Dr. Auld, indeed, regards the great majority of asthmatic cases as due to auto-sensitization resulting from defective metamorphosis of foreign protein.

It would be interesting to know the frequency of sensitization in normal people: Cooke and Vander Veer[9] estimate that the frequency of human sensitization *with* clinical manifestations is probably not over 10 per cent. But are there any figures to show what percentage of persons who have not had clinical symptoms give positive skin reactions and so may be regarded as latent or potentially sensitive cases and liable to manifest symptoms under favourable conditions? Longcope, Cooke and Vander Veer, and Caulfield[6] refer to cases of the kind.

Although it appears to be generally assumed that asthma and other manifestations of sensitiveness coming on late in life are definitely acquired independently of a transmitted tendency, there are some difficulties, possibly superficial only, in at once accepting this view. It might be argued that, if this were true, acquired hypersensitiveness as the result of therapeutic injection of horse serum should be extremely common instead of being rare, for a very large number of the population have been injected with serum, especially males with antitetanic serum during the war. The proposition is therefore put forward for discussion whether in man sensitization is acquired in the absence of a transmitted tendency which, often latent and not well marked, is crystallized by repeated stimulation into a specific hypersensitiveness to the foreign protein.* This proposition is perhaps supported by the following speculation to the effect that serum sickness is also a manifestation of latent natural hypersensitiveness.

Serum Sickness: a Manifestation of Latent Natural Sensitiveness?—Since the time when serum sickness in man, which follows one injection of serum, was compared to anaphylactic shock occurring in animals after a second injection of serum, the relation between the two has been much discussed. Coca[7] insists on the difference between them; in animal anaphylaxis the symptoms occur directly after the second injection, whereas in serum sickness they follow the first injection, but with an interval of ten days or so. He definitely says that the symptoms of serum sickness are not those of true anaphylaxis, but those of human hypersensitiveness. Now, this can be expanded into the further hypothesis that serum sickness occurs only in persons with a transmitted natural hypersensitiveness. But there is an obvious distinction between the manifestations of ordinary serum sickness and the sudden collapse, or even death occasionally, seen in man after a first injection of serum, and explained as due to the presence of well marked natural sensitiveness (Coca's allergy).

In 1909 Gillette[15] collected 30 such deaths, and in 22 of them there was a history of asthma or some respiratory disorder. In 1917 Kolmer[22] estimated that there were 40 such cases on record. According to Park,[35] death occurs in one case out of 70,000 injected, and chiefly in cases of status lymphaticus, thus recalling Symmers's view.

Kolmer,[22] after discussing the cause of the long incubation period in ordinary serum sickness, says that serum

* After this was written I came on a footnote in Freeman's paper (*Proc. Roy. Soc. Med.*, 1920, xiii, 143) to the effect that a bacterial cutaneo-reaction may be obtained in cases of bacterial intoxication (for example, severe pyorrhoea) without symptoms of asthma, urticaria, etc.; and that such symptoms would have occurred if the patient had had a toxic idiopathy but may develop rheumatism or gout instead, if the diathesis happen to be in this direction.

sickness and sudden collapse or even death after a first injection of serum are fundamentally the same. It might therefore be suggested that they both depend on the presence of natural hypersensitiveness which, however, is present in very different degrees in the two cases; it may be assumed to be so slight in ordinary serum sickness that it might otherwise never have given rise to any clinical symptoms. In the fortunately rare case of sudden collapse or death after a single injection of serum the natural hypersensitiveness must be high, as indeed is shown by the frequency of pre-existing asthma in Gillette's figures. It may be added that Mackenzie and Leake[29] put forward as one of three possible explanations of insusceptibility to serum sickness the hypothesis that the tissue cells in these individuals are impermeable to the foreign protein.

Age.—From analysis of 400 cases of asthma Walker[47] found that the number of first attacks in the quinquennial periods from 5 to 45 years of age was about the same; after 45 there was a great fall, and after 60 there were only 3 cases; a large number (16.5 per cent.) of Walker's 400 cases were in the first five years of life, a period when the existence of asthma is often unsuspected and therefore unrecognized. Age has a very distinct influence on sensibility to skin tests; of the patients who began to have asthma under 2 years 83 per cent. were sensitive to some protein, of those between 2 and 5 years 90 per cent., and then the percentage diminished until, among the cases in which the first attack occurred after the age of 50, none were sensitive (Walker). Multiple sensitization is much more frequent in cases in which the symptoms begin in infancy, and its incidence diminishes as the age of the first attack increases. In infancy and childhood foods, especially milk in the first year, are mainly responsible for asthma; according to Walker the association of asthma and eczema in early life points to food as the etiological factor. In early adult life hay fever and asthma due to emanations from horses and other animals come to the fore and may persist throughout life; and in later life bacterial infection is the main initial cause.

Season.—Asthma confined to the summer is usually hay fever due to sensitization to pollens. Winter asthma is usually due to bacterial infection, and hay fever in the summer may leave behind it bronchitis and bacterial asthma, so that the patient suffers all the year round.

Occupation. — By exposing a sensitive person to the corresponding protein, occupation, such as in stables or farms, is obviously of the greatest importance and needs no further discussion, though interesting instances of cases at first obscure can thus be explained. Of prolonged exposure to a foreign protein as a cause of acquired hypersensitiveness there appears to be less evidence than might naturally be anticipated; bakers are known to develop asthma; Walker[47] records sensitization to the protein in green coffee and to that of boxwood dust used in polishing jewels in men whose work exposed them to these excitants.

Limitations of Skin Tests.

Although reliance must mainly be placed on skin tests for the diagnosis of protein sensitiveness, since there is no clinical or laboratory test to be compared with them for differential accuracy, they have at present considerable limitations. The value of positive skin reactions is shown by the success of treatment (desensitization, avoidance of the food protein, or vaccines) based on the information thus provided in 100 cases with relief from asthma in 82 per cent. (Walker[46]). Not more than 50 per cent. of all cases give a positive skin reaction:

Out of Walker's[47] 400 cases of asthma 191, or 48 per cent., gave a positive reaction; out of Sanford's[40] 800 cases more than 500 were negative; out of Caulfield's[6] 161 cases of asthma 47, or 29 per cent., were positive.

The percentage of positive reactions falls as the age of onset of symptoms rises: thus none of Walker's[47] cases commencing after 50 years of age gave a positive reaction; and it is significant that a high proportion of the cases arising in later life are ascribed to sensitization to bacterial protein. Individuals are often sensitive to more than one protein, and in estimating the significance of a positive reaction the clinical bearing of this should be remembered; a patient may give a positive cutaneous reaction to a protein which is not responsible for asthma at that time; thus a positive reaction to a pollen in the case of asthma active in the winter should not without further consideration be accepted as a proof that an asthmatic attack is undoubtedly due to this cause. Out of 74 cases with a positive skin reaction Rackemann[37] found that 40, or 54 per cent., were compatible with the patient's history, and so justified a diagnosis.

As at least 50 per cent. of the cases of asthma do not give a cutaneous reaction to available proteins, the question arises, What significance should be attached to a negative reaction in the presence of symptoms referable to a specific sensitization? There would appear to be several explanations of a failure to obtain a positive skin reaction. The known forms of protein that may cause sensitization are very numerous. At the New York Hospital[2] 130 test substances are employed, and in one case Rosenbloom[39] tried 113. Gottlieb[17] investigated 32 patients with an average of 66 tests each. But there are probably many still unrecognized, and as their reactions are so specific the existence of any one may easily be missed. This would appear to be particularly true of the intrinsic forms of asthma—namely, those due to changes in the patient's body, such as infections of the mouth, tonsils, nose, throat, bronchi, alimentary canal, and other parts.

Walker's[47] classification shows that of the asthma cases giving a negative skin reaction to proteins those ascribed to bacteria take a very prominent place; Sanford[40] carried out 365 tests with *Staphylococcus pyogenes aureus* and *Staphylococcus albus* with constantly negative results. Caulfield[6] states that positive skin reactions in bacterial asthma were so seldom observed at the Soldiers' Civil Re-establishment Clinic at Toronto that the test was practically discarded. These skin reactions to bacterial protein undoubtedly contrast with those obtained to other proteins, especially those of epidermic origin, and on this ground, and on want of success with vaccine treatment as compared with other forms of protein therapy, Caulfield doubts if bacterial protein has an etiological importance in asthma equal to that of other proteins.

In performing skin tests on cases of asthma with bronchial infection, protein from the predominant organisms—such as streptococci or staphylococci—would obviously be advisable, as in Rackemann's series of forty cases; or, if an autogenous vaccine is not employed, the protein of the organisms usually present in such cases should be used in preference to a single strain or a combination of the known types of strains (Walker and Adkinson[49]). This same reason for negative skin reactions would also apply to the rather hypothetical cases of metabolic asthma due to production of abnormal proteins by disordered action of the alimentary canal, liver, pancreas, or ductless glands; for the proteins thus formed would be unknown, and so could be employed only by chance in the skin tests. Another possible fallacy in the application of skin tests is that in cases of infection of mucous membranes proteins other than those of the bacteria present may pass through the damaged mucous membrane (*vide* McNeil[30]) and sensitize the patient. In such cases the bacterial protein need not give a positive skin reaction, though a vaccine might, by curing the inflammatory state of the mucous membrane and so obviating absorption of other foreign protein, prevent further symptoms. As Kolmer[21] points out, the chemical nature of the protein used for testing the skin sensitiveness may undergo a change in the course of its preparation, and so fail to elicit a reaction. It is fully recognized that sensitiveness may be local; and the varying sites of clinical symptoms due to hypersensitiveness seen in asthma, hay fever, and urticaria make it reasonable to believe that in some cases of bronchial sensitiveness the skin may escape or only become sensitive after an interval. In the early and acute stages of such a condition sensitization may not yet have spread to the skin. Temporary desensitization to a protein may occur after attacks, especially when well marked, excited by this protein; Schloss refers to cases in infants with disappearance of previously positive skin reactions for periods of twenty-six to forty-four days after urticaria; but more information is required as to the occurrence of this event in other forms of allergy, especially asthma.

On the other hand it must also be borne in mind that a skin reaction which is not really specific may imitate and be regarded as positive. Thus a traumatic skin reaction may be due to a preservative in the testing fluid, such as carbolic acid or tricresol, or to a preformed toxin as in the diphtheria toxin used in Schick's test. A pseudo or non-specific protein reaction due to interaction in the skin of

protein of any kind, especially in large quantity, with non-specific proteolytic ferments, is usually avoided by the small quantity of the material used for testing and by control tests. But drugs, particularly iodides and bromides, increase these non-specific reactions, and this fallacy should be borne in mind. The intradermic tests, though more delicate than cutaneous tests, have the accompanying disadvantages that they are more likely to bring out a non-specific or pseudo-reaction, and are more difficult both to perform and to interpret.

Treatment.

1. *Prophylactic Treatment.*—The avoidance of the foreign protein to which the patient is sensitized is too obvious to require insistence. In Walker's[47] hands attempts to desensitize asthmatic patients against food proteins by their subcutaneous injection or by giving gradually increased amounts by the mouth have failed, and he believes that prolonged abstinence is automatically followed by desensitization. In infants of a stock showing a history of protein hypersensitiveness immunity to cow's milk may be cultivated during the period of suckling by the administration of cow's milk at intervals of ten days or longer (Talbot[45]), and Blackfan[4] recommends the administration of egg protein in capsules.

2. *Specific Desensitization.*—Patients very frequently show multiple sensitization; thus, among 551 cases of sensitization Cooke and Vander Veer[9] found 42 per cent. to be multiple; in such cases successful treatment depends on the selection of the offending protein and thus may take some time. The desensitization may be carried out by hypodermic injection or attempted by oral administration. While there are some points of general agreement, there are several debatable questions. Cases of pollen fever are, as a rule, successfully immunized by hypodermic injection, and the treatment should be begun and mainly carried on out of the season, or if in the season or when the symptoms are present with much smaller doses. Goodale[16] points out that knowledge of the phylogenetic relations of plants saves much specialization; thus one grass pollen will suffice for all grasses, one rose pollen for all members of the rose family, and ragweed pollen (not present in Europe) for all the Compositae. Caulfield,[6] however, disputes this. Noon,[38] in 1911, selected timothy grass (*Phleum pratense*), and later in that year Freeman[12] decided that it was unnecessary to select different pollens for treatment of different patients.

Failure may be due to several factors: bacterial infection may complicate pollen fever and a vicious circle result, each factor favouring the incidence of the other, so that for a cure it will be necessary to employ vaccine treatment for both these factors. There may be errors in the dosage which, if too large, may excite an attack; and Caulfield throws out the warning that the use of commercial multivalent solutions of pollens may sensitize patients to pollens other than those to which they were previously susceptible.

Patients shown by skin tests to be sensitive to the protein of animal hair, such as horse dandruff, cat, dog, and cow hair, and feathers (and often they are sensitive to more than one), are readily desensitized by subcutaneous injection of the protein. On the other hand, Walker[47] found that in patients sensitive to food proteins subcutaneous injection was not satisfactory, and, as already pointed out, he relies on their exclusion from the diet. Infants intolerant to their mother's milk or that of cows, and suffering mainly from vomiting, have been cured by subcutaneous injection of the milk that upsets them (Weill).[50]

Vaccine Treatment.—The results appear to depend, as would naturally be anticipated, on whether the patient gives a positive skin reaction to the protein of an organism which is then administered, or whether reliance for the choice of the vaccine has to be placed on the predominant organism in the sputum or other discharge.

Thus out of 178 asthmatic patients treated with vaccines by Walker,[48] 28 were sensitive to bacterial protein, and when treated with the corresponding vaccine 75 per cent. were relieved and 21 per cent. improved; whereas of the cases in which no skin reactions were obtained, 40 per cent. were relieved and 20 per cent. improved by vaccines from the predominant organism. Rackemann,[37] dealing with 40 cases, confirmed this.

The most important micro-organism in Walker's experience was the *Staphylococcus pyogenes aureus*, but Rackemann, and Montgomery and Sicard regard streptococci as more often responsible. If sputum is not available the secretions of the throat or the faeces should be investigated. It seems generally agreed that autogenous vaccines are more effective than stock vaccines. A vaccine may act non-specifically, or it may exert a beneficial effect indirectly by removing infection of a mucous surface through which some other protein had previously gained an entrance.

Desensitization by the oral administration of the offending food protein, such as that of eggs, milk or meat, in small and increasing quantities, has given rise to some difference of opinion. As already mentioned, Walker considers it useless in asthma; but it has been recommended, especially in other manifestations of sensitiveness, by Schloss, Talbot and Gottlieb as a means of bringing about lasting immunity. Rectal administration of the offending protein, recommended on experimental grounds by Besredka, has not often been employed; Cordier[10] had two successes and two failures.

Under the name of digestive antianaphylaxis, Pagniez and Vallery-Radot[34] describe a method of preventing the onset of symptoms due to a food protein by the ingestion of a very small quantity of this protein an hour before a meal containing that protein, and report considerable success. But here the immunizing dose remains the same and has to be constantly repeated.

3. *Non-specific Treatment.*—It is not always easy to draw the line between the specific and the non-specific action of a protein. It seems clear that peptone may act as a non-specific desensitizer; but is it certain that a protein to which the patient is sensitive always acts specifically and not in the same manner as peptone? In a series of papers since 1917 Dr. A. G. Auld[3] has advocated the intramuscular (especially in children) or intravenous injections of peptone for asthma and other manifestations of sensitiveness. Peptone is regarded as acting as a non-specific desensitizer, and, as far as the peptone treatment is concerned, it is therefore unnecessary to determine by skin tests the exact protein that is the antigen. The injections are given slowly so as to avoid any reaction; and the cases of asthma fall into two groups—the old-standing cases with bronchitis which do not respond to peptone, and those of comparatively shorter duration which are rapidly relieved and remain fairly free from the attacks. The administration by the mouth of a small quantity (0.5 gram) of peptone an hour before a meal at varying intervals, as the patient's idiosyncrasy may direct, has been found by Widal, Abrami, and Brissaud[51] to prevent manifestations of sensitiveness, such as urticaria, angioneurotic oedema, migraine, and asthma. They find that complete desensitization can be obtained by the prolonged oral administration of peptone, and add that, should this fail, hypodermic injection of other proteins may be employed. Pagniez and Vallery-Radot had little success in asthma and none in epilepsy.

4. Symptomatic treatment by drugs or other means that relax spasm or act centrally on the sensitized nerve cells may be briefly referred to.

Atropine, adrenaline, amyl nitrite, and benzyl benzoate may relieve the symptoms by relaxing spasm of the bronchial muscles. Of the last and most recent of these Miller has already formed a disappointing opinion. With regard to adrenaline, Dr. A. F. Hurst[19] pointed out that the amount usually injected hypodermically was, at any rate as far as he was concerned, excessive, and that 3 minims of 1 in 1,000 solution, though it instantly relieved the asthma, made him ill with tremor and tachycardia. These manifestations correspond fairly well with the effect of adrenaline in the rather hypothetical condition of sympathicotonia described by Eppinger and Hess, who, however, regarded asthma as a pre-eminent example of vagotonia. Adrenaline, cocaine, novocain, and orthoform emulsion have also been applied endobronchially.

From Besredka's experiments on guinea-pigs showing that by anaesthesia with ethyl chloride, ethyl oxide, or chloral anaphylactic shock can be prevented, it would appear reasonable to employ chloral, and though it is not often used and Miller[32] finds it unsatisfactory, it has had a remarkable effect in controlling some cases of asthma. Comparatively large doses of common salt were shown by C. Richet, Brodin, and Saint-Girons[38] to prevent anaphylactic shock, and were thought to act by impregnating the nerve cells and so prevent them from being affected.

It does not appear that this method has been tried in human sensitiveness, but it is worth consideration. Sea voyages, which obviously remove hay fever and other patients from exposure to antigens, may conceivably also exert some effect by this means. Calcium chloride, however, has been used clinically though without any remarkable results, and possibly potassium iodide, which has long had some reputation in asthma, may act in a similar manner to sodium chloride, though it is supposed to act on the bronchial muscles and secretion. Quinine, on the other hand, apparently in virtue of its powerful influence on ferment action, and not by causing bronchial spasm, or possibly in forming with the body proteins a new and foreign protein, has in animals exaggerated anaphylactic shock (Smith [43]), and so might conceivably do harm in asthma.

Treatment of patients not giving skin reactions must depend largely on their own knowledge of the factors apparently responsible for their attacks. The elimination of infective foci, for example, in the tonsils or mouth, should be effected. In some instances their blood serum agglutinates an organism, an autogenous vaccine of which may act beneficially; in other cases an autogenous vaccine of the predominant organism in the sputum does good.

Points for Discussion.

1. Is all asthma, excluding cardiac and renal dyspnoea, due to hypersensitiveness, or is there a residue of true reflex asthma?

2. Is there a metabolic asthma due to auto-sensitization?

3. Is hypersensitiveness, apart from that due to injections of serum, ever acquired *de novo* and without an underlying inborn tendency?

4. What is the relation of asthma associated with bronchial or other infections and not giving positive skin tests to the more characteristic cases in earlier life? Are they acquired?

5. What percentage of normal persons who have never had any clinical manifestations of protein sensitiveness give positive skin tests?

6. Limitations of the skin tests. The reasons for failure—antigen unrecognized or altered in preparation; local sensitiveness; desensitization by an attack.

7. Treatment. Specific. Limitations of subcutaneous desensitization of alimentary sensitiveness. Non-specific peptone treatment.

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JOHN FREEMAN, M.D.,
London.

DR. JOHN FREEMAN took the first point suggested for discussion by Sir Humphry Rolleston, Are all asthmas due to a protein sensitization or are some of the cases due to nervous reflexes? He said they were due to both. There was no single cause, but a chain of circumstances, of which three links at least were necessary in every case—the protein sensitization, the hereditary diathesis, and precipitating nervous reflexes. Hay fever was to him the standard type of toxic idiopathy. In this the protein element, the grass pollen, was very evident, yet even here a patient would tell you that attacks were precipitated by nervous reflexes such as emotion, light, smell, change of temperature, and so on. Suggestion alone was sufficient in some cases, but of course only when the grass pollen was about. Osler's story of producing hay fever by smelling an artificial rose could be capped in the speaker's experience, where an acute attack was induced by graphically describing a field of mustard to a man who believed this plant to be the cause of his trouble. Conversely, suggestion treatment did tend to stop many types of asthma by controlling the emotions.

With regard to the question: Should bronchial asthma be put in the same category as the other types of asthma? the speaker thought that it should. They were connected by the same hereditary taint; thus, for example, a family might contain one or two hay fever subjects, a horse asthmatic, a food sensitive, and, may be, one or two bronchial asthmatics; or a number of these disabilities might descend on one single individual. Furthermore, these different toxic idiopathies in one person would "summate" in producing asthma. An instance was given of a woman with well marked cat asthma and bronchial asthma, and after the bronchitis had been removed by appropriate vaccines the cat asthma disappeared also. Similarly there were cases where bronchial asthmatics were also either potato-sensitive or horse-asthmatic or feather-sensitive; or hay fever could be combined with a green-pea-sensitiveness or a strawberry-sensitiveness or with horse-asthma. In such cases of summation, the removal of one factor might stop the other factor from producing asthma. If bronchial asthma could summate with undoubted toxic idiopathies, it must belong to the same category. Lastly, though bacterial skin reactions were usually insignificant or absent, they sometimes did occur.

The speaker then demonstrated a small cabinet in which filter papers impregnated with various test proteins were conveniently filed away on the card index system.

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THE subject of protein hypersensitiveness was one that offered a wide field for investigation. His interest was aroused in the subject by investigating a case of intermittent hydrarthrosis, where there was sensitivity to proteins from the synovial fluid. This sensitivity offered a possible explanation of the symptoms and the periodicity exhibited by this disease. In carrying out investigations on asthma and allied conditions this periodicity had been borne in mind.

The tests had been applied in about 500 cases of asthma, and 40 per cent. were found to react to one or more of the skin protein tests. Those which did not react were largely cases of chronic bronchitis, and probably infective in origin. Of the cases where a positive reaction was obtained extracts of pollen proteins were found to be the most frequent type, and the next in frequency were the meat proteins. Cases of asthma reacting to fur and feathers, horse dandruff, eggs, and vegetable proteins were also detected by these tests. It was important to realize that the proteins must be carefully prepared, attention being paid more particularly to avoidance of heating and the use of Jena glass vessels for extraction and preservation. The tests had also been applied in cases of urticaria, hay fever, epilepsy, and various forms of gastro-intestinal diseases. With regard to the question of hypersensitivity acquired later in life reference was made to the occurrence of asthma in a seed merchant and of horse asthma in a soldier enlisted in the Veterinary Corps.

The tests were applied to cases of asthma and allied conditions, and it was found that hypersensitiveness

varied at different times. After a severe attack the reactions might be quite negative for three weeks, and after this interval positive results were obtained. With regard to treatment in cases of food protein sensitivity the most effective and simplest remedy appeared to be the removal of the particular food from the dietary. In cases of sensitivity to pollens desensitization with small graduated doses of pollen extract should be tried. A word of warning might be given as to the avoidance of large doses of pollen extract, since alarming symptoms might follow its use.

Frank Coke, F.R.C.S.,
London.

It is unfortunate that life is not long enough to embody in one individual the physiologist, the biochemist, and the bacteriologist, together with a specialist who sees a multitude of these cases of asthma, hay fever, skin troubles, and other allied affections, so that, speaking purely as a clinician, one has to rely on the advice, the lectures, and the published accounts of the experimental work of the physiologists and other scientists, to give an explanation of the practical facts of asthma, as we see it in the consulting room or at the bedside.

I am convinced that the work on anaphylaxis, or as von Pirquet calls it, allergy, does represent a solid platform on which we can build much of practical value in the treatment of asthma. I attach the greatest importance to the skin reactions, which must be carried out fully and thoroughly. I think the following cases will show their usefulness:

45. A small boy, who had only had asthma during the winter holidays, was sensitive to almonds when tested with thirty different proteins.

93. A young man, who occasionally had severe attacks of asthma, was positive to tomatoes out of forty-three tests.

261. A young man, in the office of a firm who milled various cattle foods, had, from time to time, severe attacks of asthma at his work: he was sensitive to beans and peas, each attack being then found to synchronize with the milling of haricot beans.

269. A lady, who has always suffered from gastro-intestinal disturbances, has had a gastro-enterostomy performed and every movable appendage in her abdomen taken away. She appeared to be a typical case of gastric ulcer, with tenderness over the stomach and sickness after most meals. She gave a large reaction to wheat, oats and eggs. Since leaving these off she has been entirely normal, except recently for a night's sickness after eating raspberry soufflé which contained bread-crumbs.

313. A young man had a patch of angio-neurotic oedema each morning on waking. He was sensitive to chicken feathers.

In each case their symptoms have entirely disappeared as long as they have kept away from the offending protein.

If we can identify the proteins at fault, and they are such that can be eliminated, a cure is easy and certain. One may see many score of cases before one sees two even approximately alike; nevertheless, rough groupings soon become evident. First, there are those who give skin reactions and those who do not, the border line depending obviously on the efficiency of the examination. Chandler Walker groups these into what he calls typical bronchial asthma and atypical asthmatic bronchitis.

This is all very well after you have done the skin test, but in the majority of cases one is utterly unable to classify them beforehand or to say which will give a reaction and which will not. There is a group of patients who always have asthma and always have had it. There is another group of patients who only get asthma but who always get asthma after a cold; this is apart from the non-infective "colds," which are a symptom of the true asthmatic attack. Perhaps they are only sensitive at these times. An interesting point on this is the fact that Weil of Lyons, who uses injections of milk to desensitize babies who are intolerant to milk, finds that after being cured they again become intolerant to milk should they catch measles or other infectious complaint. Many date their asthma from an infectious complaint, especially whooping-cough in children and pneumonia in adults.

There are the thin asthmatics and the fat asthmatics. There is a large group of patients who get their asthma whenever they eat too largely or too late at night—Adam's week-end type. Others are particularly affected by barometric changes, or perhaps more rightly electric storms. There is the east wind group, who have a miserable time each spring. Many of these are sensitive to some common protein, and these weather changes merely give them exacerbations. So ghastly are their big attacks that they will overlook the fact that they have really always got it. This must be remembered in taking their histories of attacks and localities. But no matter how, when, where or why they get their attacks, the essential lung change is the same: an obstruction to respiration caused by a narrowing of the bronchioles by the spasm of their muscular tissue. Subsequent inflammation, bronchitis, and microbic infection may alter this picture, whilst in certain cases the mucus membrane may be in an urticarial condition as well, owing to the protein being inhaled directly on to it, comparable to the nasal mucus membrane in hay fever or to the skin reactions. Patients who have a slight chronic asthma from eating oats or wheat will have stupendous attacks if they go threshing or milling. It may take a week to cough the flour out again.

But the main condition is the bronchial spasm, a spasm which one sometimes sees disappear absolutely instantaneously with a heavy dose of adrenaline. The bronchial spasm is typical of experimental anaphylaxis, and if we admit the connexion in this case, can we find no other causes of bronchial spasm to explain those cases which do not appear to be anaphylactic?

On searching through back literature we can find other causes of bronchial spasm, just as closely connected with anaphylaxis, as are those cases of asthma which do not give skin reactions with those that do. In each case these substances are protein derivatives. Dale and Laidlaw have investigated the physiological properties of β-imin-azolyl-ethylamine, or histamine. It is formed when CO_2 is split off from histidin, or by the action of putrefactive organisms. Dale has obtained it from ergot of rye, from which it is formed by the *Claviceps purpurea*. Berthelot and Bertrand have isolated organisms from the intestine which have an especial power of forming histamine. Histamine is an extremely powerful poison; its chief action is to cause a violent spasm of plain muscle. The bronchial spasm produced is so great that air cannot be forced either into the lungs or out of them, and the appearance is exactly the same as that found by Auer and Lewis in the lungs of guinea-pigs who have been killed by anaphylaxis. A slip of the uterus in Ringer's solution gives a contraction when histamine is added in the strength of one part in 2,500,000. Histamine gives a skin reaction exactly similar to a *plus* five skin reaction given by a horse asthmatic to horse dander. If it is of any interest to the Section to see a typical skin reaction, I will produce one now on my own arm with histamine.

The symptoms of anaphylaxis vary in different animals; the symptoms of poisoning by histamine vary in exactly the same way. Eustis found histamine in the stools of three asthmatics out of ten. It is certain that histamine can be formed in the intestine and perhaps in other parts of the body. It is present in commercial extracts of pituitary gland and in commercial peptone and proteoses. It does not therefore require any great stretch of imagination to see in the presence of histamine an explanation of one class of asthma—that connected with a dirty tongue, an ill digestion, or a torpid liver, for which a purge and starvation make such an effective cure.

On scanning the literature further we find the fact noted by the Vaughan family that all proteins contain a poison group, which can be split off from all forms of protein, whether microbic, animal, or vegetable. The poison group is quite different from the bacterial toxins; it is just as poisonous whether it be split off from the protein of the typhoid bacillus or from an egg. After the poison group has been split off, an animal can be sensitized with the non-poisonous residue, but to get anaphylaxis with a second dose the poison group must be left in the protein. The presence of the poison group is therefore essential to the phenomena of anaphylaxis.

Now, if the poison group be administered alone to the animal, we are told that exactly the same symptoms occur as with histamine or with anaphylaxis. The minimal lethal dose is the same as that of histamine. Again, the symptoms vary in the different animals exactly as those of anaphylaxis. Heart and blood pressure symptoms predominate in the rabbit, asphyxial symptoms in the guinea-pig, and gastro-intestinal disturbances in the dog. We have, then, three methods by which bronchial spasm can be produced in animals: by anaphylaxis, by histamine, and by the poison group.

I take as my contribution to this discussion the argument that we may go a step further than saying that asthma is due to sensitization to a foreign protein, and say that asthma is due to poisoning by protein derivatives, whether they be liberated parenterally by anaphylaxis or formed in the gut by bacterial or other faulty digestion. All foreign protein introduced into the body has to be broken down into simpler elements before the animal can pick and choose from which to build up its own specific proteins. Now the way proteins are broken down into more simple substances is by means of enzyme action. It is not difficult to imagine, at any rate in theory, how these poison groups become split off.

Elaborating my suggestion of a digestive substance mentioned in my paper on asthma and anaphylaxis published in the BRITISH MEDICAL JOURNAL on March 12th, 1921, we have then, on the entrance into the body of a foreign protein, a specific ferment made to deal with the specific protein that has gained entrance to the body. Two or three factors seem especially active in causing a protein to sensitize a patient. A course of albumin water given to a baby during a bout of diarrhoea will find a ready road of entrance through the inflamed mucus membrane. A short course of unusual food which does not become a regular article of diet is another. A mother who is nursing her child may, for some reason, put it on cow's milk for a week and then return it to breast feeding. That child will be liable to become sensitized to cow's milk. I think this factor is especially important in common sensitization to strawberries, mushrooms, crabs, and lobsters. One has a good feed of them and no more for some months. Hay fever is similar. The next seems to be prolonged contact with a protein in unusual amount—to wit, the cat or dog that sleeps on the bed, and the occupational asthmas of the ostler, or the butcher, or baker. Sensitization is especially prone to occur when the protein comes into contact with mucus membrane of the lungs or nose directly, as with the animal hairs, powdered foods in mills and factories, or again, with the hay pollen.

Underlying all this there is often some predisposition to become sensitive to something. I am at present testing the blood groupings of these people to see if that throws any light on the subject. However introduced, the protein is digested and disappears, and I think the theory that a specific enzyme is formed to deal with it is the correct one. This takes some time to do. There is an incubation period of some ten or fourteen days. Towards the end of this time the protein is at last rapidly digested, so rapidly that a quantity of the poison group is thrown off, giving us the serum rashes and the joint pains, etc. If we talk of enzyme action we must call the antigen protein substrate and the antibody the enzyme itself.

Enzymes have many properties. One is the fact that they can be brought to equilibrium, or in other words their action is slowed down or stopped by the accumulation of their end-products. Fermentation of wine ceases from the presence of the end-products, alcohol and CO_2. I think it is the presence of end-products that prevents an ordinary serum rash from being a severer anaphylaxis. Anti-anaphylaxis is merely a temporary affair, and I think it is the bringing of the specific enzyme to equilibrium by the formation of end-products from a small digestion of the protein substrate.

But to return to more practical points. Many patients give a history of having had a course of vaccine treatment that caused considerable improvement for a time. Now, although entirely unspecific, I think they do good, for this reason—namely, that in digesting them end-products are formed which also act in bringing the specific ferments to a point of equilibrium. Peptone probably works in this way. CO_2 will bring the ferments in your champagne to equilibrium, no matter how the CO_2 is formed. As we should expect, the cure is only temporary, and when these non specific end-products cease to work the specific enzyme again gets busy, with the resultant asthma.

We may therefore look to cure asthma if we can discover, by the skin tests, the article of food or environment which is the specific protein substrate from which the specific enzyme in the patient's body will split off the poison group, and, having found it, remove it; if we can remove the specific enzyme; if by easily ingested end-products we can bring it to equilibrium; if we can prevent the formation of histamine in the bowel; if we can maintain a healthy liver to break up any improperly digested products that may enter the portal system; or if we can administer an antidote to these poisons in the intestine, the blood, or the bronchial muscle, should we be unable to prevent their formation.

A. E. Gow, M.D., F.R.C.P.,
London.

THE treatment of asthma by peptone has been referred to. You, Mr. President, have honoured me by a request to speak on this subject, and though I have very little information to offer, your commands must be obeyed.

The fashion in which many asthmatics react to Witte peptone appears to furnish strong evidence that there are at least two factors in the production of the disease—the state of hypersensitiveness is not the only one. An asthmatic subject, when injected with Witte peptone, is prone to develop a transient urticaria or angio-neurotic oedema, which shows, I think, the close causal relationship of these conditions. The majority of the subjects of bronchial asthma that I have tested with Witte peptone give a positive intradermal reaction; but not all individuals who give a positive test have a manifest toxic idiopathy. It seems that though the best results of peptone treatment are obtained in those cases which do show a well marked intradermal reaction, some of the others may be benefited. A well marked intradermal reaction, one in which the redness spreads perhaps all round the forearm and persists for more than six hours, is a sign that the initial therapeutic dose for intravenous injection must be very small; such a reaction presumably indicates a very high degree of sensitiveness, and the small quantity of the 10 per cent. solution used in the test may even be sufficient to induce urticaria. In ordinary cases I begin at present with the intravenous injection of 0.2 c.cm. of a 2 per cent. solution of Witte peptone, increasing the dose by 0.1 c.cm. or 0.2 c.cm. every five to seven days, if necessary, until a mild "immediate" reaction is produced—a transient feeling of fullness in the head or slight oppression in the chest. Too large a dose is followed either immediately by palpitation, dyspnoea, and giddiness, or later by a rigor, usually in from half to one hour. Treatment should not be begun during an attack.

Some cases of asthma and hay fever are remarkably sensitive to intravenous injection of Witte peptone. Having found his intradermal test positive, I recently gave 0.2 c.cm. of a 2 per cent. solution as a first dose to a patient who has had asthma for many years. Within a minute he vomited, his eyes became suffused, and in less than five minutes his back was covered with urticaria. Another man, now nearly 50 years of age, had suffered from asthma since the age of 6 months. Much emphysema and bronchitis was associated, the sputum containing both streptococci and the *Micrococcus catarrhalis*—the infection which, in my experience, is the most likely to yield to vaccine therapy. However, in his case a prolonged course administered by Dr. Lawrence of Gravesend through the last winter but one did no good. He proved unusually sensitive to Witte peptone—1 c.cm. of a 1 per cent. solution has been followed frequently by a rigor, but fortunately ½ c.cm. is sufficient to keep him free from attacks. In a lady with hay fever to whom it has been advisable to give only very small doses, each injection is followed by a little urticaria.

Another peculiarity about these cases, in my experience, is that they do not develop any "tolerance" to peptone injections—that is, when a dose is given once a week or so. There are many different brands of "peptone" on the market, of which some are doubtless more toxic than others, and I do wish to utter a word of warning. Peptone in many of these "toxic idiopathies" is a dangerous drug; it should not be given during a paroxysm and its indiscriminate use will lead sooner or later to disaster and bring discredit on what I believe to be, in certain cases, a valuable remedy.

DISCUSSION.

Dr. WARREN CROWE (Harrogate) related a case of a farmer who was free from asthma while in charge of horses in Salonica, but whose asthma recurred on returning to his own farm.

Dr. CHALMERS (Sunderland) had hoped for more information on the treatment of asthma; he referred to several

cases of asthma and commented on surgical interference in the nose.

Dr. HAMILTON (Glasgow) regretted that there had been no combination with the Section of Psychiatry in this discussion, as suggestion often played so important a part in the cure, and he considered that asthma in general practice was far more a nerve condition than he had been led to believe that day.

Dr. GREENFIELD (Rushden) expressed the opinion that the cutaneous tests were too delicate for general practitioners, but thought peptone treatment would be useful, and asked for details.

Dr. JOHN STENHOUSE (Toronto) related several cases of asthma. He thought that the disease was probably due to toxic products.

Dr. JOHN F. WALKER (Southend-on-Sea) asked for information as to the utility of the ophthalmic reaction, and expressed the opinion that information obtained by general practitioners in this condition should be collected in some way for consideration by experts.

Dr. FREEMAN and Dr. GOW replied to various questions dealing with the ophthalmic reaction and peptone treatment respectively, and Sir HUMPHRY ROLLESTON summed up the main points of the discussion.

Demonstrations.

In the afternoon a demonstration of the skin reactions in asthma was given by Dr. MACKENZIE WALLIS in the Pathological Department. At the Royal Infirmary, in addition to ward demonstrations by the honorary medical staff, the following were demonstrated: The negative pressure in the pericardium, by Dr. G. ARBOUR STEPHENS; the treatment of tuberculosis with an attenuated tubercle vaccine, by Dr. NATHAN RAW; the value of tuberculin in the treatment of bone tuberculosis, by Dr. W. CAMAC WILKINSON; the technique of artificial pneumothorax, by Dr. F. G. COLEY.

ADOLESCENT TETANY AND ITS RELATION TO GUANIDIN.

BY

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(From the Royal Victoria Infirmary, Newcastle-upon-Tyne, and the Institute of Physiology, University of Glasgow.)

IN 1917 Noël Paton and Findlay[1] showed that the symptoms of tetania parathyreopriva and of tetany are similar to those produced by the subcutaneous administration of salts of guanidin, while Burns and Sharpe[2] demonstrated that in the former condition in dogs the amount of guanidin in the blood and urine is increased, and that, in the latter condition in infants, a marked increase occurs in the urine. It was impossible to get sufficient blood from them for analysis. In 1918 Burns and Watson[3] showed that parathyroidectomy produces similar effects on the heart to those produced by the administration of guanidin.

The conclusion seemed inevitable that the symptoms of tetania parathyreopriva and of idiopathic tetany of children are both due to some error in the metabolism of guanidin in the body.

Findlay and Sharpe[4] in 1920 recorded a case of adult tetany in which the excretion of guanidin in the urine and the faeces was markedly above the normal. We are now able to record another case of the same kind in which the excretion of guanidin by the urine and the faeces was estimated. The clinical features of the case are of no little interest.

The patient, a girl of 15, first came under observation in January, 1920, complaining of attacks of painful spasm of the hands. From her description of the seizures tetany was suspected, and subsequently on many occasions typical attacks of tetany have been observed.

History.

The attacks commenced suddenly and without warning about a year before she came under observation. At first the spasms occurred at intervals varying from a week to a month, but they gradually increased in frequency until finally they occurred two or three times daily. The duration of each attack also became progressively longer, and the later attacks lasted for two or more hours.

In severe and prolonged attacks usually both hands, but sometimes one only, became red, hot, and painful.

The patient was occasionally wakened at night by cramp in the feet, but this was the only indication of any affection of the feet similar to that of the hands. Apart from the spasms she felt in perfect health. She was habitually constipated, but not severely. Menstruation commenced a month or two before the first attack in the hands, and was irregular and of excessive duration (frequently lasting for twelve days with intervals of only a fortnight), but she had felt no ill effects of the heavy losses. Her mother stated that the patient never had any similar attacks as an infant, nor any convulsions nor child-crowing. She had never had any serious illness.

Her father and mother were healthy, but her maternal grandmother suffered from generalized spasms which the mother (a very intelligent woman) described as being like the patient's. A great aunt on the paternal side was treated for some condition with thyroid extract. A sister, now aged 22, suffered from the age of 14 to 19 years from attacks exactly resembling those of the patient. The patient has also two brothers, who are healthy. No evidence of infantile convulsions or laryngismus stridulus in any member of the family was obtained.

Present Condition.

The patient is healthy in appearance, well nourished (weight 7 st. 7 lb.), and intelligent. There is a slight uniform enlargement of the thyroid gland, no greater than that often seen in girls at puberty, and no signs of hyperthyroidism. The left thumb is deformed, the terminal phalanx at the interphalangeal joint being deviated to the ulnar side at an angle of about 20 degrees. Examination reveals no other abnormality in any part of the body.

The attacks of tetany occur with no apparent cause, and do not appear to be influenced by nervousness nor capable of being produced by suggestion. An attack in one hand can be induced by pressure on the corresponding nerve trunks in the upper arm (Trousseau's sign), and a very severe attack in the right hand followed shortly after galvanic testing of the right ulnar nerve.

There is very marked twitching of all the muscles on one side of the face on percussion of the corresponding facial nerve near its exit from the stylo-mastoid foramen (Chvostek's sign). The irritability of the peripheral nerves to galvanic stimulation is much greater than normal, and the characteristic reactions to the opening stimuli are strikingly manifest (Erb's sign). The reactions of the right ulnar nerve, stimulated behind the internal epicondyle of the humerus, in the patient and in a control case at the same time under the same conditions, were as follows:

	Patient.		Control.
A.O.C.	..... 0.6 ma.	.....	3.5 ma.
K.C.C.	..... 0 8 ma.	.....	1.0 ma.
A.C.C.	..... 1.0 ma.	.....	1.4 ma.
K.O.C.	..... 2.0 ma.	.....	over 7-8 ma.

Examination of the Patient's Family.

The sister, who without doubt had tetany which ceased three years ago, appears in every respect normal. The electrical reactions are normal and Chvostek's sign is not present.

The younger brother, aged 17 years, shows Chvostek's sign of quite marked degree, but much less than in the case of the patient herself. The elder brother, aged 24 years, shows a slight degree of the same sign.

THE EXCRETION OF GUANIDIN.

The patient was admitted to the Royal Victoria Infirmary, Newcastle, on April 10th, 1920, under Dr. Beattie. She was placed upon a creatine-free diet for one week, during which time the whole of the urine and a watery extract of the whole of the faeces were collected, each being evaporated daily to a small bulk with the addition of a few drops of thymol in chloroform. They were sent to Professor Noël Paton at the Physiological Laboratory of the University of Glasgow and the guanidin content was estimated by one of us (J. S. S.).

During this week of special dieting the patient had three attacks of tetany of average severity. No laxative or other drug was given during the week, and the bowels moved naturally on six days out of the seven.

Chemical Examination.

The urine and extract of faeces, each amounting to almost a full Winchester quart, were treated by the method described (Findlay and Sharpe[4]). The results were calculated as guanidin in milligrams per diem.

TABLE I.

By urine...	305.0
By faeces	17.0
Total per kilo of body weight	6.7

The examination of the picrate precipitates gave the following results:

TABLE II.

	Found.		Calculated as Dimethylguanidin.
Total nitrogen	... 24.0 %	.....	26.5 %
Melting point	... 226° C.	.....	225° C.

This indicates that the guanidin is chiefly in the form of dimethylguanidin, as it was in the case of adult tetany previously recorded (loc. cit.). In that case the excretion by the urine was 4.8 mg. per kilo a day, against 6.7 mg. in the present case. In the case of active idiopathic tetany in children recorded in 1917[2] the excretion of guanidin by the urine (determined by the aurichloride method) averaged 0.49 mg. per kilo a day, in latent tetany 0.47 mg., and in a case recovered from tetany 0.12 mg., while in five cases free from tetany the average was 0.116 mg. per kilo a day. In dogs suffering from tetania parathyreopriva the average excretion in the urine (determined by the aurichloride method) was 1.0 mg. per kilo a day.

Later experience has shown that results obtained by the aurichloride method are lower than those by the picrate method, and that the yield depends largely upon the concentration of the solution from which crystallization takes place. While of use in giving comparative results in a series of simultaneous determinations it is somewhat unreliable, and it has been abandoned for the picrate method, which has proved more accurate and much more rapid.

Subsequent observations have shown no excess of ethereal sulphates in the urine when the attacks are frequent. There is no evidence of pancreatic deficiency as tested by Loewi's adrenaline mydriasis test, the amount of diastase in the urine, and the fat, starch, and protein content of the faeces.

Treatment.

A prolonged trial has been made of parathyroid tablets (Armour), gr. 1/20, by the mouth, the dose being increased gradually to three tablets three times daily. No curative action can definitely be ascribed to this treatment, for though remissions have occurred, similar remissions have been seen when the tablets were omitted. The addition of thyroid tablets, gr. v once daily, has so far produced no appreciable effect.

A definite remission followed the week in which the patient was in hospital on a meat-free diet. But in spite of limiting subsequently the amount of meat and meat extracts in the diet, and ensuring regular action of the bowels, the attacks continue to recur at very variable intervals. There is, however, no doubt that their frequency and severity are considerably less than they were. The administration of salol by the mouth has not appeared to influence the attacks. Trial is now being made of calcium salts.

The estimation of the urinary sulphates, and the examination of the faeces for evidences of pancreatic defect, were carried out by G. J. Crawford.

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THE SACHS-GEORGI PRECIPITATION TEST FOR SYPHILIS

AND A COMPARISON WITH THE WASSERMANN REACTION IN OVER 1,500 CASES.

BY

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(From the Pathological Department of the University and Western Infirmary, Glasgow.)

THE formation of precipitate in a mixture of syphilitic serum with lipoids or other reagents has been frequently recorded. But it was not until the work of Sachs with Georgi, and Meinicke[1] had defined more precisely the conditions necessary for eliciting the phenomenon that it appeared to compare with the Wassermann reaction in point of specificity and constancy as a test for syphilis. It has been found that with a suitable antigen (alcoholic extract of human heart reinforced by the addition of cholesterol according to the principle for the Wassermann antigen established by Browning, Cruickshank, and Mackenzie), when appropriately diluted and incubated at 37° C. for eighteen to twenty hours, precipitates are produced in the presence of heated syphilitic serums, whereas non-syphilitic serums in similar conditions fail to cause precipitum formation.

Method of the Test.

Antigen.—1 gram of minced human heart muscle (nature of case immaterial), freed from fat, is extracted at room temperature with 5 c.cm. of absolute alcohol for forty-eight hours, shaking at intervals, and finally filtered; the clear filtrate is kept in the dark at room temperature. To prepare an emulsion for use in the test 1 c.cm. of this extract is diluted with 2 c.cm. of absolute alcohol; to 1 c.cm. of this diluted extract 0.045-0.05 c.cm. of 1 per cent. alcoholic solution of cholesterol is added. Then 1 c.cm. of cholesterolized extract is placed in a 3 by ½ in. test tube and 1 c.cm. of 0.85 per cent. NaCl solution ("saline") is rapidly poured into it from a similar tube (when greater volumes are required correspondingly larger tubes are used): after the mixture has stood for five minutes at room temperature, 4 c.cm. more of saline are added rapidly in the same fashion as before and the emulsion is used for the test after standing for five to fifteen minutes at room temperature. The antigen should appear opalescent, but without flocculi when examined with a hand lens. (When the antigen has stood by itself for a longer time—for example, more than twenty minutes at room temperature, visible precipitation sometimes occurs in the antigen control on incubation.)

Serum (within seven days after withdrawal of blood) is tested after standing for several hours at room temperature, subsequent to heating for thirty minutes at 55° to 56° C.

As *controls for a series of tests* (1) negative, weak and strong positive serums are used as in carrying out the Wassermann reaction; (2) a tube containing the lipoid emulsion and saline is included as the antigen control.

The reagents are measured in the following order into 3×½ in. test tubes in the amounts shown. The contents of each tube

Main Test.		Serum Control.	Antigen Control for each Series of Tests.
First Tube.	Second Tube.	Third Tube.	
0.9 c.cm. saline	0.9 c.cm. saline	0.9 c.cm. saline	0.9 c.cm. saline
+	+	+	+
0.05 c.cm. serum	0.1 c.cm. serum	0.1 c.cm. serum	0.5 c.cm. antigen
+	+	+	
0.5 c.cm. antigen	0.5 c.cm. antigen	0.5 c.cm. 16.6 per cent. dilution of alcohol in saline	

are immediately mixed by gentle shaking and then placed at 37° C. for eighteen to twenty hours; the results are read on withdrawing the tubes from the incubator. The antigen and serum controls and also the mixture of known negative serum with antigen should all show no flocculation.

The *reading of results* is carried out as in the case of bacterial sedimentation tests. In order to detect weak reactions it is advisable to use a hand magnifying lens; but in estimating such weak reactions it is essential to compare carefully the control with a known negative serum, as slight flocculation may occasionally occur in the latter. Provided the negative control and the serum control show no flocculation, then precipitation which is just visible with the magnifying glass constitutes a suspicious reaction, while flocculation visible to the unaided eye constitutes a positive result.

*Results Compared with the Wassermann Test.**

In a series of 1,575 serums (including 296 cases already investigated by Taniguchi), comprising cases submitted to the laboratory from the wards of a general hospital, as well as the venereal diseases centre, the following results were obtained:

Parallel results:		
No. of cases	1418	= 90%
Reaction positive in both tests in ...	553	
,, negative in both tests in ...	845	
,, doubtful in both tests in ...	20	
Discrepancies:		
No. of cases	157	= 10%
Positive Wassermann, but negative or doubtful Sachs-Georgi in	23	
Negative or doubtful Wassermann, but positive Sachs-Georgi in	77	

When cases of syphilis which have undergone specific treatment are grouped by themselves it is seen that the proportion of positive results with the Sachs-Georgi test is greater than with the Wassermann reaction.

Results in 316 Serums from Treated Cases.

Parallel results:		
No. of cases	256	= 81%
Reaction positive in both tests in ...	152	
,, negative in both tests in ...	97	
,, doubtful in both tests in ...	7	
Discrepancies:		
No. of cases	60	= 19%
Positive Wassermann, but negative or doubtful Sachs-Georgi in	5	
Negative or doubtful Wassermann, but positive Sachs-Georgi in	44	

* The Wassermann reactions were carried out as described in Browning and Watson's *Venereal Diseases* (London, 1919) using human heart cholesterol antigen.

Points of Practical Importance in Performing the Test.

1. Heated serum should be used; unheated serums from positive cases may fail to cause precipitation in any concentrations (a wide range of concentrations has been tested).

2. The concentrations of serum recommended should not be exceeded, since heated normal serums in large amounts—for example, 0.2 to 0.3 c.cm.—may cause precipitation. No positive case has been met with in which the usual amounts of heated serum employed failed to show precipitate, but the reaction may be more marked with 0.05 c.cm. of serum than with 0.1 c.cm.

3. The mixture must be kept at 37° C., as precipitate may form with non-syphilitic serums at lower temperatures. Sometimes, however, it is advantageous in the case of weak reactions to record the results after the tubes have stood for thirty minutes further at room temperature, but the behaviour of the negative control must be carefully scrutinized.

4. The results should be controlled by including in each series of tests known negative, weak and strong positive serums, just as in the case of the Wassermann reaction.

REFERENCE.

[1] Taniguchi, T. (1921): *The British Journal of Experimental Pathology*, 2, 41.

TYPHOID FEVER IN AN INFANT COMPLICATED BY SUPPURATIVE ARTHRITIS.

BY

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THE following case, in which a double subacute suppurative arthritis supervened in the case of a child, aged 9 months, suffering from typhoid fever, seems to me worthy of recording in some detail:

On May 14th, 1921, I was called to see a baby, aged 9 months, as the mother noticed it was very hot; up to this date it had been quite well. I found the axillary temperature was 102°. Careful examination disclosed no other abnormality. On May 15th the morning temperature was 104.8°, and the evening temperature 104°. The blood was negative as regards malarial parasites. The pyrexia continued, and on May 19th four rose spots typical of typhoid fever appeared, the spleen was palpable, and the abdomen distended. Typhoid fever was diagnosed. The Widal test was not done as the diagnosis appeared to be clear and the mother resented any active interference.

On May 20th slight rigidity of the neck was observed; there was no squint, and Kernig's sign was not present. The cervical rigidity lasted twelve hours only. On May 21st several new rose spots appeared and the spleen was still more enlarged, and on May 23rd there was a further copious crop of fresh rose spots. On May 25th (eleventh day) the pyrexia ranged from 100.2° to 102.2°. It was noticed that the baby made little use of the right arm. The hand grip was normal, and careful examination showed no sign of any epiphysitis or joint trouble.

On May 31st (seventeenth day) the temperature dropped in two hours from 103° to 95°. The infant was very cold and sweated profusely, but the pulse was only 84. Brandy was administered and hot bottles applied. Perforation was feared, but the abdomen appeared to be normal, and although the necessity for laparotomy was considered I decided not to operate. In a few hours the temperature had risen to 102.2°. From this date the pyrexia showed a tendency to diminish, and the temperature was slightly subnormal on the morning of June 4th. The paresis of the right arm continued, but the hand grip remained firm, and repeated examinations revealed no tenderness or swelling over joints or epiphyses. The infant, however, appeared to be generally hyperaesthetic, and resented movement or handling of any part of the body.

On June 5th severe diarrhoea began with some mucus in the stools; the temperature was 99° in the morning and 100.4° in the evening. On June 7th (twenty-fourth day) the right shoulder-joint was slightly distended; there was no redness of the skin over the joint. On June 8th the right shoulder-joint was explored with a needle and syringe; a considerable quantity of thick greenish pus was withdrawn.

Operation.

On June 9th the baby was anaesthetized. The *left* shoulder-joint, though distension was scarcely appreciable, was very fortunately aspirated and pus discovered in it. Both shoulder-joints were then opened anteriorly between the deltoid and pectoral muscles. A considerable quantity of pus was removed from both joints. (Incidentally this shows the futility of hoping to empty a joint of pus by aspiration. I had thought I had emptied the left joint completely by aspiration, but on opening the capsule I found more pus remained than I had removed.)

The joints were thoroughly irrigated with mercury biniodide, 1 in 4,000, and the capsules closed with catgut. The skin was sutured with silkworm gut. The infant stood the operation very well and there was no appreciable shock.

After the operation the temperature only once exceeded 99°, on the fifth day rising to 102° in the evening. The skin sutures were removed, and the wounds, which were slightly septic, were dressed with acriflavine and allowed to granulate. From this day the baby caused no anxiety. No extension or splint was applied. By June 26th the wounds were healed. Movement of both joints was quite free in all directions. On July 4th the baby was in excellent condition, taking its food well and using the shoulder-joints freely.

Bacteriology.

From the pus a culture on agar was made. The result was a pure culture of a Gram-positive diplococcus. The pathologist reported that he believed the organism to be the "enterococcus" isolated and described by Thiercelin in 1899. In the *Précis de Bacteriologie*, by Dopter and Sacquépée, 1914, this organism is described as causing secondary arthritis following tuberculosis, paratyphoid, etc.

The following points appear to me to be of interest:

1. The age of the patient. Osler and McCrae (1907, p. 81) give the incidence of typhoid in the first year of life as 0.013 per cent., and state that in the first year the disease is rare. On p. 176 they state, however, that: "Formerly regarded as rare, we have learned that typhoid fever during the first years of life is not uncommon. . . . Griffith and Ostheimer collected 325 undoubted cases under the age of 2½. Of these, 111 were in the first year. Of those in the first year recovery was noted in about 25 per cent. . . . The mortality of the published cases is high, but the milder cases are often overlooked or not reported." Although blood culture and Widal's test were not done, the course of the illness, the rose spots, and the enlargement of the spleen left no doubt in my mind but that the diagnosis was correct.

2. The sudden fall of temperature on the seventeenth day strongly suggested perforation; Osler and McCrae state that this may denote the onset of suppuration.

3. The disuse of the right arm was first noticed on May 25th (eleventh day), and arthritis was presumably present at that time. Nevertheless, from the seventeenth to twenty-fourth day the temperature came down as in a typical uncomplicated attack of typhoid.

4. Although there was pus in the left shoulder-joint, no limitation of movement and very little swelling of the joint was observed. Had I not known that the right shoulder-joint contained pus I would have seen no indication for exploring the left. As it was, it was more due to good fortune than to accurate diagnosis that I explored the left joint on the operating table. I certainly never expected that unimpaired function of the affected joints would be preserved.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ANAPHYLAXIS DUE TO ANTISTREPTOCOCCAL SERUM.

MRS. X, aged 23, primipara, gave birth on June 7th to a child, which was born naturally, without any manipulation; the placenta and membranes came away quite intact; chloroform was administered during the birth of the head.

On the third day the temperature rose to 100° F., the breasts were very full of milk; on the fourth day the temperature was 101° F. and the lochia very foul. I gave her 10 c.cm. of antistreptococcal serum, polyvalent (P., D. and Co.), half an hour afterwards an urticarial rash appeared with oedema of the eyelids; this cleared away in a few hours. Next day I gave her 5 c.cm. of serum, the temperature came down and the lochia became less offensive; the vagina was washed out with a solution of mercury perchloride. Everything seemed to go well, the patient ate her food and enjoyed it, until the twelfth day when she suddenly became ill. The rash recurred with generalized intensity, the temperature fell to 96° F., and she became very faint but revived after the administration of brandy. Headache was very bad, and 10 grains of phenalgin were administered; calcium chloride was prescribed, 40 grains being given during the next twelve hours. On the morning of the fourteenth day the rash

had gone and the patient appeared better, the calcium chloride was continued until the evening, when it was stopped owing to severe headache. About 9 p.m. the rash reappeared, and in six hours was thick and universal, oedema of the larynx and tongue developed, and there was cyanosis and difficulty of breathing; adrenaline was sprayed on the fauces and 5 minims administered hypodermically; she vomited twice and felt relieved, and the rash diminished, but she was very collapsed.

From this time the condition of the patient improved. On the evening of the fifteenth day she complained of severe pains in her limbs. Calcium lactate was now given instead of calcium chloride (10 grains every four hours until 80 grains had been taken). The temperature and pulse became normal on the sixteenth day, the pains in the limbs disappeared, and convalescence since has been uninterrupted.

This case is of considerable interest from the fact that fifteen years ago antidiphtherial serum was administered during an attack of diphtheria without any reaction. It is probable that this injection rendered her, even after the lapse of so long a time, peculiarly susceptible to the effects of an injection of horse serum. Although no doubt a rare case, this is one of considerable moment and interest to the general practitioner in view of the modern and successful treatment of puerperal fever.

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CAESAREAN SECTION.

I have read with interest the article entitled, "A plea for more frequent use of Caesarean section," in the British Medical Journal of July 16th (p. 75), and heartily endorse the remarks made by Dr. Arnold Jones. At the same time I think the latter may be interested to hear the experience of others, particularly from the point of view of future pregnancies.

Of a series of seven cases operated on for various causes I have had the opportunity of observing later pregnancies in two. I may mention that living children were obtained in all cases.

Case I.—Operated on in October, 1913, and again in September, 1920. After the second occasion the patient was sterilized.

Case II.—May, 1917. Fourth pregnancy. Obstructed labour. Attempts to deliver by forceps both at home and in hospital having failed, Caesarean section was performed. A large child with a big head was born. December, 1919, the same patient was delivered of a normal child without aid.

On all occasions I have used a longitudinal incision through the anterior uterine wall at about its middle, and closed the wound with deep and superficial catgut sutures, the deep sutures including the uterine muscle, but, of course, passing beneath the decidua, erring on the side of too many rather than too few sutures.

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Reviews.

HEART AND KIDNEY.

The subject of the interesting little book by Josué and Parturier[1] is one of daily importance in general practice; in it close observation at the bedside is combined with careful laboratory analysis. Readers will recognize but too well their experience of cases half renal half cardiac, cases in which the patients suffer from horrible dyspnoea, from dropsies, from hepatic and pulmonary congestion and scantiness of urine, and of the difficulty in many of them to decide how much of the fault is to be attributed to the kidney, how much to the heart. The purpose of this book is to aid us to determine this distribution.

When Ambard's estimation of degrees of non-protein nitrogen in the blood were first published many of us hoped that in this method we should find a constant which would enable us to decide in each case on the proportions of renal and cardiac default. Unfortunately these hopes were soon dashed; the uraemic concentrations proved to be far too variable to serve as a standard for kidney values; the "constant" was a widely fluctuating inconstancy. The azotaemia was low when we expected it to be high, and high when we had rightly supposed that the renal element of the case was but secondary. The authors tell us that so long as oliguria, relative or positive, persists, so long estimates of azotaemia cannot help us; high as, within limits, the degree may be, it may fall rapidly as soon as free urinary flow is re-established.

The ruling condition is the rate of renal circulation. If the rate falls, then, be the kidneys sound or unsound, retention of urea in the blood will ensue; but if, by therapeutic means, the heart be invigorated a large liberating flow of urine should follow, and thereupon the nitrogen load in the blood would be lightened. If the kidneys be sound it will fall to normal, unless the hepatic function of uric formation be also in default. In this last case of course the azotaemia of the blood may fall below normal, and the patient's life be in the greater peril. But this is another story. The authors' point is the physiological "solidarity" of kidneys and heart, and the infinite gradations between the cardiac and the renal extremes. It is not until an equilibrium be obtained between these organs that we can be in a position to decide their several responsibilities. This anxious question of the degree of renal fault, or of cardiac fault, in these cases comes home to all of us.

Happily, a little patience, and the aid of that wonderful drug digitalis, give a way out, or at worst a means of discrimination. While the authors do not forget to warn us not to begin the use of the drug until by some unloading of the liver and intestinal tract, and perhaps by a venesection, the system is prepared for it, yet then let it be used boldly, and not laid aside until the end is gained. On two points the present writer is in agreement with them—namely, in a preference for digitalin before the leaf or the tincture, and in the need, in some cases, of a continuous use of the drug over long periods of time, subject, of course, to incidental vigilance and intermittence as occasion may require. They urge also that we are not to be content with a "normal" urinary response; the diuresis must be in proportion to the arrears, continuously copious and liberating. In case of kidney default coming into view the authors advise the addition of theobromine as a stimulant to the renal epithelium and blood vessels. They urge, rightly enough, that the collection and measurements of the urine should be made by the physician himself, but few of us are in a position to follow this counsel of perfection.

The authors do not forget the alternatives of renal tests, and discuss some of these; but rightly, in our opinion, they relegate them to a secondary place in diagnosis. In any case their use will be to the best advantage after some equilibrium has first been obtained by the cardio-tonic methods. They remark incidentally how little, if at all, in these fluctuations the urea disturbs the osmotic tension of the cells.

In respect of blood pressures the authors make some valuable observations. They do not express an opinion as to the condition named "hyperpiesia"—high pressures without renal disease; but they properly insist on the importance of records of diastolic pressures and of the relation between systolic and diastolic. It is during periods of high pressures, generally with cardiac hypertrophy, that lapses of myocardial efficiency may gradually steal in unnoticed; and it is in such phases that the digitalis acts so efficiently in restoring diuresis, and that appreciation of kidney values may best be undertaken. In "granular kidney," likewise, a slight lassitude of the heart may first reveal the renal default. An azotaemia of more than 1.50 is suggestive of renal disease. The authors administer also sugar—they use lactose—in cases of failing myocardium. They have never found the confident use of digitalis of any harm in the renal cases, but, on the contrary, of service in promoting elimination.

The behaviour of salt in the dropsical cases is fully discussed; the authors are of opinion that there is a rivalry for the kidney path outwards between the uric and the saline constituent. But, in conclusion, the authors very rightly urge that in all cases the treatment shall be carefully adapted to the needs of the individual patient.

In some allusion to angina pectoris, as a feature of some of these cases, it is of interest to note that they accept the doctrine of the aortic causation of this malady. They say (p. 134): "Certains auteurs attribuent à l'insuffisance du

[1] *Les Cardio-rénaux. Etude Théorique et Pratique.* Par le Docteur O. Josué et le Docteur M. Parturier. Paris: E. le Francois. 1921. (Post 8vo, pp. 223. 12 francs; post free 13 francs 20.)

coeur gauche les crises d'angine de poitrine. . . . Nous pouvons dire que telle n'est pas la cause de l'angine de poitrine. Celle-ci est en realité la douleur de l'aorte ascendante, malade et momentanément distendue, par suite d'une augmentation passagère de la pression arterielle." ["Many authors attribute attacks of angina pectoris to insufficiency of the left heart. . . . We are in a position to say that this is not the cause of the angina; it is in reality pain in the ascending aorta, diseased and momentarily distended owing to a temporary rise in arterial pressure."]

This little book may be confidently recommended to every practitioner of medicine; it is highly practical, while also fortifying practice with laboratory verifications. It is written in the lucid and logical manner of our French colleagues, and if rather full of reiterations, well, as teachers they are aware of the importance of repetition in driving their teachings home. C. A.

IN-BREEDING AND OUT-BREEDING.

THAT the effects of in-breeding are of necessity bad, particularly when the in-breeding takes place among human beings, is an idea that has been long and persistently held. Marriage between first cousins is very generally condemned. The idea is largely based on prejudice arising probably from the fallacy of arguing from the particular to the general. The progeny of some cousin-marriages are sometimes defective, and such cases are cited as "terrible examples," but other cases, equally if not more numerous, in which the progeny are normal, pass unnoticed.

The whole problem of cross-breeding is ably discussed by Drs. E. M. EAST and D. F. JONES in one of the monographs on experimental biology appropriately entitled *In-breeding and Out-breeding*.[2]

After giving a summary of the probable evolution of the asexual and sexual methods of reproduction in plants and animals, followed by the usual statement of the elements of the principles of Mendelism, the authors proceed to give an account of numerous in-breeding experiments, both in plants and animals, describing the effects on sterility and on the production of heterosis or hybrid vigour. These chapters will be of interest to the agriculturalist and to the stock-breeder. To medical men and sociologists the introduction and the two concluding chapters will make a particular appeal; it is here that the effects on the individual of in-breeding and out-breeding in man and the results of the intermingling of races are discussed. The reader must not be disappointed if he finds no hard and fast statements laid down. In the present very imperfect state of knowledge such statements cannot be made. The problems are too intricate, the evidence too uncertain, and the inability to control experiments makes the difficulties almost insuperable. But the real interest lies in the authors' statement of the problems themselves and the avenues of thought and suggestion which are opened out in the practical treatment of all social questions dealing with race betterment.

As a result of the experimental evidence in the breeding of horses and cattle, the authors conclude that "crossing followed by in-breeding has been the touchstone of success," "cross-breeding to furnish a variety of character combinations from which to select . . . in-breeding to provide the opportunity to isolate the combinations desired." Such statements, valuable as they may be to the agriculturalist and stock-breeder, cannot be applied to the human race since matings cannot be controlled. Nevertheless, the examination of such evidence as exists points in the same direction as the wider and more accurate information derived from horses and cattle.

Heredity and environment are the two potent factors in human evolution. Social reformers are too apt to rely on the latter to the exclusion of the former; they follow the line of least resistance. According to Galton, ancient Attica provided the ablest race in history, and here there must have been much in-breeding. On the other hand, it is difficult at the present time to realize how different was the environment, for we are told that "the great poet was valued more highly than the wealthy merchant." Heredity and environment undoubtedly played their parts in the production of so high a percentage of illustrious men. The authors of the volume under consideration fully recognize the importance of both factors, while drawing particular attention to that of heredity. It is just this which is so eminently necessary and which they do so successfully.

The text for the book may be summed up in their own words: "All we would ask is that the physician, the clergyman, the social worker, the penologist, the statesman, give conscientious consideration to the facts of heredity as a guiding principle in the solution of the problems of the family with which they have to do." The book should appeal to a wide circle outside the limited ranks of the professional biologist for whom it is primarily intended.

[2] *In-breeding and Out-breeding: Their Genetic and Sociological Significance.* By Edward M. East, Ph.D., and Donald F. Jones, Sc.D. Philadelphia and London: J. B. Lippincott and Co. 1920. (Post 8vo, pp. 285; 46 figures. 10s. 6d. net.)

WORK IN MENTAL HOSPITALS.

DR. JOHN MACARTHUR, Senior Assistant Medical Officer, London County Mental Hospital, Colney Hatch, has written a *Mental Hospital Manual*[3] to meet the needs of the medical man who is taking up work for the first time in a mental hospital. There is room for a book of the kind, for the work in a large hospital for the insane necessarily differs in many respects from that in a general hospital, and the assistant medical officer finds himself in an atmosphere to which he is quite unaccustomed, and in which he feels the need of definite guidance. The wide experience of the author of this volume has well fitted him to understand the difficulties of his junior colleagues, and the administrative details therein contained and the practical advice given will be found distinctly serviceable to those for whom it is intended. No attempt is made to give a systematic account of mental disorder. The book is essentially practical and contains a number of useful facts not included in the ordinary textbook of insanity.

An account of the design and structure of a mental hospital is followed by a detailed summary of the duties of the assistant medical officer in relation to the staff and patients. Several chapters are devoted to treatment, both general and medicinal, with particular reference to the routine management of excited, irresponsible and suicidal cases. Dr. Macarthur rightly insists that the medical officer should acquire an intimate individual knowledge of the patients under his charge; there is perhaps no branch of medicine in which the personal influence of the physician is so important. Due emphasis is laid upon the benefit derived from dental treatment in mental hospitals—often sadly neglected—and it is most satisfactory to read in a footnote (p. 100) that the London County Council has recently appointed dentists to all their mental hospitals. A full account is given of the duties of the medical officer in regard to the admission of patients, the various methods of certification are described, copies of the certificates are printed, and the statutory regulations in connexion with lunacy administration are summarized. Certain omissions are perhaps inevitable in a book of this kind, and we miss especially any reference to the parole system which has been utilized with much success in many mental hospitals.

This book may safely be recommended to the assistant medical officers of mental hospitals; a knowledge of its contents will do much to help them in the routine of their daily work.

MEDICAL JURISPRUDENCE.

IN reviewing earlier editions of Dr. AITCHISON ROBERTSON'S *Manual of Medical Jurisprudence and Toxicology*[4] we described it as an excellent short textbook for students. Perusal of the fourth edition induces us, while still recognizing its merits, to suggest that it now stands in need of revision, at any rate for the use of English students. It is not correct to say that in a case of murder or manslaughter the magistrate depends upon the medical evidence already sworn before the coroner. The statement that the dissipated habits of the lower classes play a large part in the death of infants from overlying has, we believe, been

[3] *Mental Hospital Manual.* By John Macarthur, L.R.C.S., L.R.C.P. London: Henry Frowde, and Hodder and Stoughton. 1921. (Pp. vi+215; charts and diagrams. 15s. net.)

[4] *Manual of Medical Jurisprudence and Toxicology.* By W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E., F.R.S.E. Fourth edition. London: A. and C. Black, Limited. 1921. (Cr. 8vo, pp. 424; 26 figures. 12s. 6d. net.)

disproved. It is not correct to say that the majority of suicides from poisoning in Great Britain are due to carbolic acid, nor that arsenic is a common poison used by suicides, for it is responsible for only about three such deaths a year. The statement that the Mental Treatment Act, 1915, allows the detention for not longer than six months of cases of temporary insanity without certification and permits the detention of cases of mental disorder traceable to wounds, shock, etc., due to warfare, needs revision. There is in fact no such Act. While it may readily be admitted that the coroners' procedure is susceptible of improvement, still if it is "notorious" that "great discredit" is thrown upon the system by ridiculous findings, the author should have supported his indictment by instances more recent than those quoted.

The section on insanity has become out of date. No mention is made of Kraepelin's work on manic-depressive insanity, and acute confusional insanity is omitted. "Moral" insanity, "impulsive" insanity, and the "insanity of pregnancy" are described as though still recognized as definite forms of psychoses. The description of paranoia is inadequate. Under the heading of dementia the author describes dementia praecox (in four lines) and also "acute dementia or stupor" in young persons and adults, which he ascribes chiefly to sexual over-indulgence or masturbation, and may, he states, produce a condition similar to idiocy or imbecility. It is not clear what difference the author draws between dementia praecox and acute dementia in young persons, while stupor is, we believe, usually regarded as a form of melancholia.

We hope that in a future edition the author will deal with the points we have mentioned, for he writes clearly and concisely, and there is room for a book which gives a more complete account of Scottish procedure than is contained in most works on the subject.

CHINA AND MODERN MEDICINE.

IN *China and Modern Medicine*,[5] by the Dean of the School of Medicine of Shantung, is to be found an attractively written summary of the development in China of medical mission work and of Western medicine. Reason is shown for believing that the pioneer of both was Thomas Richardson Colledge, but whether at the time he began his work he was merely an able, well trained pupil of Sir Astley Cooper, or a formally qualified medical man, can be determined neither from this volume nor yet from the account of Colledge's life in the *Dictionary of National Biography*. What alone seems certain is that the initial stimulus was the sight of so much unrelieved suffering when he first landed in China as a ship's doctor; that in 1827, when he must have been aged about 30, he succeeded in opening at Macao a hospital for eye cases; and that some ten years later he joined hands with Peter Parker, a Yale graduate and newcomer, in founding "The Medical Missionary Society in China." These two and those who followed them were indubitably very successful, as have been so many medical men elsewhere, in putting the outcome of Christianity and Western civilization in an attractive light. These workers recognized, too, from the beginning that their aim must be not alone to treat the Chinese, but also to teach the Chinese how to treat themselves. The extent to which this second aim has been attained is well brought out in the later half of the volume. The general impression left is that eventually the Chinese will adopt the principles of modern medicine as heartily as their neighbours the Japanese and apply them not less skilfully. It will be a great result considering that many even of the present pioneers of scientific medicine in the Far East—the medical mission hospitals—must be severely handicapped in their labours by inadequate equipment. This, however, does not prevent them from offering a fine field for medical men who really love their profession and are thoroughly trained therein.

Also of interest are the sections dealing with nursing questions. The importance of establishing nursing as a reputable and definitely trained profession has not been overlooked. The present outlook in this connexion seems to be promising, and one may readily concede that to help to shape the traditions of the Chinese nurse of the future, and thus to inspire the whole profession with noble ideals, is a task worthy of the very best nurse that the Homelands can produce.

Interspersed in the text are a number of wise observations on the best way of dealing with Chinese patients, and some stories, one of which makes it clear that, however ignorant of medicine he may be, a purely native physician may yet have nothing to learn in respect of the art of gaining the confidence of a patient's friends. By no means the least useful part of the volume is a series of six appendices, of which one supplies a well arranged bibliography of publications concerning medical and surgical work in China, and another specifies the qualities which should be possessed by any medical man or woman who proposes to take up work in that vast country. On the inside of the cover at each end is an outline map which facilitates comprehension of the written contents of the volume by those indifferently acquainted with the geography of China. The same map also shows the present distribution of all existing medical schools, whether Chinese, Japanese, or Anglo-American.

The book, in short, is well devised and thoroughly worth perusal. Probably its initial purpose was to inspire an active interest and to attract recruits: if that be the case, it deserves, and is likely, to be successful.

HISTOLOGY.

PROFESSOR JORDAN'S *Textbook of Histology*[6] shows no little individuality when compared with the other textbooks on this subject in the English language. For not only are the facts of microscopic anatomy set out in a very lucid manner, but their relation to function and theoretical significance are interestingly discussed. And what is more, controversial points, instead of being slurred over as is usually the case in such books, are candidly admitted. The result is that the subject matter is of value not only to the student but to the research worker also. The chapter on the different types of connective tissue and ossification—subjects usually presenting special difficulty to beginners in histology—is a model of clarity. Excellent, also, are the sections on the alimentary canal and the blood vascular system. The book has individuality in another respect. Those who write manuals on histology are usually content to describe tissues without pointing out the differences between them. From the student's standpoint this is no small defect, for his main difficulty consists not so much in recognizing tissues under the microscope, but in distinguishing between those that are superficially similar. Now Professor Jordan has succeeded in writing what is truly a medium-sized textbook of differential histology. Thus he points out how the different types of muscles should be distinguished from one another, also how not to confuse smooth muscle and dense fibrous tissues. All this is reinforced by excellent differential tables. But legitimate criticism can be made regarding some of the microphotographs. The author in his preface to the second edition says that he has "substituted drawings for some of the less satisfactory photographs of the first edition." One can only regret that he did not carry the process further. For while many of the microphotographs are excellent, it is no exaggeration to say that a professional histologist would have difficulty in the exact identification of some of them—were it not for the explanations! There is a very useful section at the end of the volume dealing with technique. Directions for practical work are also provided. We hope that when a third edition is called for Professor Jordan will provide good wash drawings in place of many of the high power photographs; the illustrations will then be up to the level of the text in excellence.

Professor PIERSOL'S *Normal Histology*[7] (twelfth edition) is a standard volume in the United States and is already well known in this country. It is primarily a handbook of microscopic anatomy, and as such furnishes facts rather than ideas. The author rightly contends that readers

[5] *China and Modern Medicine.* By Harold Balme, F.R.C.S., D.P.H. With preface by Sir Donald MacAlister, K.C.B. London: The United Council for Missionary Education. 1921. (Post 8vo, pp. 224. 5s. 3d. post free.)

[6] *A Textbook of Histology.* By Harvey Ernest Jordan, A.M., Ph.D., Professor of Histology and Embryology, University of Virginia. New York and London: D. Appleton and Co. (Double fcap. 8vo, pp. 895; 594 figures, 4 plates. 25s. net.)

[7] *Normal Histology.* With Special Reference to the Structure of the Human Body. By George A. Piersol, M.D., Sc.D., Professor of Anatomy in the University of Pennsylvania. Twelfth edition. Philadelphia and London: J. B. Lippincott Company. (Roy. 8vo, pp. 426; 438 figures. 21s. net.)

(student and other) of histological manuals are often lacking in adequate anatomical knowledge. The result is that they are unable properly to correlate what they see under the microscope with what they have dissected in the body. Therefore Professor Piersol has freely interspersed descriptions and figures of a purely anatomical nature in the text. The exposition is concise and the illustrations excellent. The chapter on the brain and spinal cord is particularly good, and its value is enhanced by the introductory section on the gross anatomy of the brain. But there are certain curious omissions—possibly intentional. Thus only the histology of the normal nerve fibre is described, no reference being made to the changes following its section. Again, the chapter on blood formation is somewhat sketchy when compared to the other chapters in the book; a subject of such importance surely merits an account fuller than can be given in less than two pages. It is a pity that short references to points of physiological importance are not made when occasion arises. The book is of medium size, and one consequently expects to find as much information as is provided in manuals of even smaller calibre. There is an appendix in which limited examples of histological methods are set out in a serviceable manner.

CHILD WELFARE WORK IN VIENNA.

ADVANTAGE was taken of the meeting in Vienna of the Women's International League Congress to hold an informal conference, under the auspices of the Friends' Relief Mission in that city, on "International aspects of child welfare work." The conference took place on July 18th, and at the first session there was a discussion on child welfare work as a factor in the promotion of international friendship and co-operation, while the second session was devoted to the excellent work for children which is being done by the Austrians themselves.

At the second session, presided over by Dr. HILDA CLARK, the head of the mission in Vienna, one of the speakers was Professor VON PIRQUET, who said that the years of under-nourishment had given a new lease to tuberculosis, always rife in the Austrian capital. Ninety per cent. of the children examined at the welfare centres reacted to his cutaneous test, which meant that they were in a condition to become tuberculous if their powers of resistance were sufficiently lowered. It was true that the death rate from tuberculosis among the young had fallen since the conclusion of the war, but it was still greatly above the pre-war normal. Austria, especially the new Austria, lacked sanatoriums; but the situation had been met to some extent by the use of hospital roofs, where, under overhead shelter, many tuberculous patients spent the whole of their time in the open air, winter and summer, with quite amazingly good results.

Miss DALYELL, a member of the mission sent to Vienna in 1919 by the Accessory Food Factors Committee, which was appointed jointly by the Lister Institute and the Medical Research Committee, said that the object of the mission was, in the first place, to find out what results had followed from the extreme scarcity of fats in the diet of the infants of Eastern Europe in the years 1917 to 1919, and to undertake as far as possible remedial measures. It had been of the greatest use to the investigators to have access to the system of exact food measurements worked out in Professor von Pirquet's clinic. The study on a large scale was only started last year, and it would be continued until the results were definite, for it had to be remembered that the deficiency diseases took a long time to develop. The two diseases which had taken the greatest toll of the infant population of Vienna were scurvy and rachitis. The prevalence of these diseases was due to the lack of milk or the unsatisfactory conditions of its supply more than to any other factor. Simple measures, such as using the raw juice of cheap vegetables throughout the winter, had been employed to prevent scurvy, and work had also been carried out on milk substitutes and on seasonal variations in the value of milk itself; but whether these measures had been instrumental in bringing about the marked decrease in rachitis which had taken place within the last year still remained to be proved. It was hoped that from this investigation in Vienna there would be such an increase in the knowledge of infant feeding that the problem of securing the normal growth during the first year of life would be brought appreciably nearer solution. The experience and statistics collected in Vienna would be of use in every country in dealing with infant nutrition.

Dr. POERNER, principal physician in charge of welfare work for infants and young children in Vienna, said that the death rate for infants was still fifty times, and the death rate for young children five times, that for older children. Study of the death rates during the last decade would help to determine the lines that welfare work should follow.

	1910.	1920.
Infant mortality (per 1,000) ...	215.8	168.6
Mortality of young children ...	21 8	24.4
Mortality of school children ...	3 1	4.05
Mortality of adolescents	4 3	6.5
Mortality (all ages)	11.5	18 5

The chief causes of death of infants and young children in Vienna during the last decade were given as follows:

	Infants.		Young children	
	1910.	1920.	1910.	1920.
Digestive diseases	28 1	20.2	3.7	5.0
Diseases of respiratory organs	26.3	23.2	28.5	23 9
General weakness	20.4	25.3	—	—
Epidemic diseases	6 5	9 8	28 5	31.0
Tuberculosis (all kinds) ...	4.0	3.7	25.0	28 3
Nervous diseases	5.4	4.1	5.5	4.4
Syphilis	1.2	1.7	0.1	0.07
Rickets	0.4	0.3	1.3	1.0

Dr. Poerner explained the decrease of digestive diseases as mainly due to the fact that in view of the fatal scarcity of fresh milk a far greater proportion of mothers nursed their babies now than in pre-war times, despite their own state of under-nourishment. The decrease of mortality from nervous diseases was attributed to the reduced consumption of alcohol on the part of the parents. General weakness now ranked first among the causes of infant mortality, suggesting an embryonic debility, the result of the war. Infant welfare work (the speaker continued) started in an organized form in Vienna in 1905. Ten years later, under the pressure of war conditions, a large organization was called into existence to help the families of mobilized soldiers, and this so-called *Kriegspatenschaft* established fourteen welfare centres, all of them attached to children's hospitals. In the year of the revolution (1918) the various organizations were safeguarded by uniting all their activities in a common and neutral agency, the Central Board for Children's Health Welfare Work. During the last year, under the auspices of this body, 85,000 young children had been examined in 70 welfare centres and the more under-nourished of them supplied with food rations out of British and American generosity. Fifty-eight of these welfare centres were still continuing their activities, the staff of each centre consisting of a doctor, two lay workers, and an attendant. With the help of the American Red Cross more welfare workers were to be employed in home visitation, and sixty welfare centres were projected for the provinces.

Dr. HORNECK, a chief magistrate, then gave an interesting account of the municipal Jugendamt, or department of child welfare, established in 1916, with branches in every district of the city. The central Jugendamt is a body of lawyers, doctors, teachers, and welfare workers, which is duly recognized as one of the municipal authorities and is given charge of all Government affairs relating to children; the branches, Bezirksjugendämter, carry out the administration locally, keeping in touch with the infant welfare centres, which are under medical control, and with the fifty-five municipal kindergartens.

At the other session of the conference child welfare was discussed as an asset in the movement towards peace and internationalism. Dr. HILDA CLARK spoke of the extraordinary response that the appeal for help for children had called forth, alike from countries recently belligerent

and from those which had remained neutral. She looked to child welfare work to raise a bulwark of good feeling which should be sufficient to resist national animosities. Mlle. FERRIERE, of the Union Internationale de Secours aux Enfants, which is the central organization in Geneva of all the "Save the children" funds in the different countries, said that this body was now shaping for itself a more permanent structure, with the object of maintaining interest in child welfare in every country. Mme. DUCHÊNE, of the French Committee of this organization, spoke on similar lines, and nobly said that if there was danger of pauperism in the countries which received assistance, this was more than counterbalanced by the gain in education to the countries which gave it. Fraulein HEYMANN, of Germany, said that relief work in her country also had assisted the international ideal, and she thought that the children who had benefited from this real Samaritanism would later on become apostles of humanity and peace. Frau HERZFELDER, of Austria, said that the children's protection societies in that country had always had an international standpoint, which the war had not entirely effaced. Miss JANE ADDAMS, President of the Women's International League of Peace and Freedom, urged the setting up of an international standard of child welfare which should make it impossible for children to starve on one side of a frontier when there was bread to spare on the other. Other speakers to the same effect were Danish and Swedish ladies. Miss ALICE FITZGERALD, head of the department of nursing of the League of Red Cross Societies, made the interesting statement that under the auspices of the League eighteen nurses from as many different countries had been sent to London for post-graduate public health training. The honorary president of this successful conference was Frau Marianne Hainisch, a famous Austrian social worker, and mother of the President of the Austrian republic.

THE PHARMACOLOGICAL VALUE OF COD-LIVER OIL.

CLINICAL observers have always been positive of the therapeutic value of cod-liver oil, but have been unable to give any explanation of its superiority to other oils.

It was believed formerly that the special value of cod-liver oil depended upon its high content of unsaturated fatty acids, and on this assumption substitutes for cod-liver oil have been prepared from vegetable oils, such as poppy seed oil or soya oil, which contained a large amount of unsaturated fatty acids. Substitutes for cod-liver oil have even been prepared from olive oil.

Cod-liver oil suffers from the disadvantages of having an unpleasant taste, and of readily becoming rancid, and manufacturers have devoted their energies to producing highly refined preparations of the oil so as to eliminate these unpleasant qualities. Doubt has frequently been expressed, however, whether the purified forms of the oil were as efficacious in therapeutics as the older and cruder preparations.

Recent research upon vitamins has thrown an entirely new light upon the action of cod-liver oil, for it has been shown that crude cod-liver oil is peculiar in containing a far larger amount of the fat-soluble vitamin A than any other foodstuff. At the present time it is difficult to form a correct estimate of the importance of vitamin deficiency in the production of disease; there is fairly conclusive evidence that such deficiency causes scurvy, infantile scurvy and beri-beri, and there is a very strong probability that it is the chief cause of rickets; and, finally, there is the possibility that vitamin deficiency may produce a host of other chronic disorders ranging from dental caries to amenorrhoea and reduced resistance to infections.

The degree to which vitamin deficiency affects the health of the community is at present uncertain, and it is very necessary to steer a course between the two extremes of an uncritical enthusiasm which attributes every disorder to lack of vitamins, and an equally irrational scepticism which denies any importance to vitamins because they are a new discovery, and because their importance is exaggerated by others. Vitamins are not exceptionally mysterious substances; it is true that they have not been isolated, and that they are readily destroyed by chemical treatment, but these properties they share with bacterial toxins and antitoxins.

Young animals die fairly rapidly on a diet deprived of vitamins, and the addition of vitamins in small quantities to such a diet enables the animals to grow normally, and in this way the existence of vitamins can be demonstrated as certainly as can the existence of an antitoxin.

The demonstration of a vitamin involves, however, prolonged feeding experiments with very careful controls. Such experiments are very difficult to perform; it is difficult to obtain a diet which is free from vitamins and is non-toxic and adequate in all other respects. Moreover, the experiments are always liable to be upset by epidemics. Finally, the reaction of different animals to vitamin-lack varies enormously; animals of different species react in very different manners; young animals are far more affected by vitamin-lack than adults; and, finally, animals of the same species and age fed upon the same diet often show considerable individual differences. Work upon vitamins is therefore bound to be extremely slow and laborious; the number of possible errors is extremely large, and it is therefore not surprising that many questions concerning vitamins are still matters of controversy.

Three vitamins are known, namely: (1) the fat-soluble vitamin A, (2) the antineuritic water-soluble vitamin B, and (3) the antiscorbutic vitamin C. These three vitamins have different distributions, different chemical properties, and different physiological actions. It is possible, and even probable, that other similar factors exist, which also have the two important characteristics of being necessary in minute amounts for animal nutrition, and of being easily destroyed.

None of the vitamins have been isolated, and therefore it is not possible to say for certain that any two deficiency diseases are produced by the lack of the same substance; all that it is possible to prove is that two diseases are caused by the lack of factors which have an identical distribution. The statement that any disease is caused by the lack of any particular vitamin only means, therefore, that it is caused by the lack of a factor which has the same distribution as that vitamin.

Animals are unable to synthesize the vitamin A contained in their fats; they obtain supplies from vegetable foods and store the vitamin in their fat. Adult animals contain a large reserve of the vitamin in their fat, and can live on these supplies for prolonged periods; and therefore it is not easy to produce any very obvious effects upon adult animals by deprivation of vitamin A. Young growing animals require much larger amounts of this vitamin and have smaller reserves, and in these deficiency of vitamin A produces effects in a few weeks or months.

Vitamin A is contained in the green leaves and the growing parts of plants, and it is from these that the animal world ultimately obtains its supply of vitamins. Vitamin A is stored by animals in their fats, and occurs in large quantities in milk fat and in egg yolk. The fats and oils of fishes and of whales also contain an exceptionally large amount of this vitamin.

All of the vitamin A present in milk is contained in the milk fat; there is therefore very little in skimmed milk; the vitamin A content of milk depends entirely upon the diet of the animal, and vitamin A may be almost completely absent from the milk of stall-fed cows. Similarly, it may be absent from the milk of women fed on a diet free from vitamins. Vitamin A is a more stable substance than the antiscorbutic vitamin C, but it is fairly readily destroyed by heating in the presence of oxygen. Hopkins[1] and others have shown that butter can be rendered vitamin-free by heating to 120° C. for four hours, provided that a current of air is passed through it.

The vitamin content of milk is reduced by pasteurization or by boiling, and both condensed and dried milk contain smaller amounts of the vitamin than does fresh milk. Lard as ordinarily manufactured contains no vitamin, and all of the vitamins of whale oil are destroyed by hydrogenation; vegetable oils and fats contain little or none of the vitamin.

The absence of vitamin A from the diet can be shown to produce in animals the following effects:[2]

1. Lack of growth in young rats (Hopkins, Drummond, and others).
2. Rickets in puppies (Mellanby).
3. Disorders of dentition in puppies (M. Mellanby).
4. Diminished resistance to infections.
5. Failure of the nutrition of the cornea resulting in xerophthalmia.
6. Tendency to oedema.

McCarrison[8] has carried out extensive observations on the effects of lack of vitamins in pigeons and in monkeys; most of these experiments were conducted with diets deficient in more than one vitamin; they proved that vitamin lack induces a whole series of gastro-intestinal disorders, including diarrhoea, dysentery, and gastric ulcer. Vitamin lack also caused profound derangement of the functions of the endocrine organs. McCarrison's results showed that lack of vitamin A was responsible in monkeys and pigeons for excessive production of adrenaline, and that in pigeons lack of this vitamin produced oedema.

The following diseases are all believed to be related to lack of vitamin A in man: rickets, osteomalacia, keratomalacia, and war oedema.

The etiology of rickets is a question of enormous sociological importance, and controversy has arisen concerning Mellanby's conclusion that rickets is a deficiency disease caused by deficiency in a factor which has the same distribution as vitamin A.

Mellanby[2] found that young puppies fed on a diet which contained no vitamin A but was sufficient in every other respect developed typical rickets after about six weeks. The bones showed typical signs of rickets on inspection, and also on radiological and histological examination. The addition of 10 c.cm. of cod-liver oil to the above diet prevented the occurrence of rickets, and cured rickets in cases in which it had already been established.

The results of Mellanby were very definite and positive, but he noted many possible sources of error. Rickets could be produced only in puppies under four months, and could be produced much more rapidly in rapidly growing than in slowly growing animals; the addition of large amounts of carbohydrates to the diet increased the liability to rickets, and the addition of large amounts of meat decreased the tendency to rickets.

Paton[3] denies that rickets is a deficiency disease and attributes it to bad housing, and has obtained negative results with feeding experiments.

The possible sources of error in experiments upon deficient diets are so numerous that it would appear proper to attach more weight to positive than to negative results.

The tragic experience of Central Europe furnishes a striking proof that rickets is a deficiency disease, for Dalyell states that 100 per cent. of infants of nine months in Vienna have rickets, and since the climate and housing conditions of Vienna are the same as in 1914 this result must be due to malnutrition; moreover, since a large proportion of the Viennese children are breast-fed the rickets must be due to maternal malnutrition.

Striking beneficial results have been obtained from the administration of cod-liver oil in all of the diseases attributed to lack of vitamin A.

1. *Deficient Growth.*—The addition of cod-liver oil to the diet of the mother in breast-fed infants in Vienna produced a most striking beneficial effect upon the rate of growth (Dalyell).[4]

2. *Rickets.*—Hess and Unger[2] found that 90 per cent. of the negro children in a New York district developed rickets, but that out of 32 infants given 54 oz. of cod-liver oil in six months only 2 developed rickets. Hess[5] believes that rickets is primarily a dietetic disorder, and admits that a lack of vitamin A plays a part in its pathogenesis, but he believes that other factors are involved and that the salt content of the diet is of importance; he is, however, convinced that cod-liver oil given in full doses, and not rendered impotent by excessive refining, is almost a specific in the treatment of rickets.

3. *Keratomalacia.*—Bloch showed that this disease, which occurred in Danish children during the war, was cured by cod-liver oil, and similar results were obtained in Vienna.

4. *Oedema.*—Menzies[6] observed hunger oedema in Poor Law institutions in England in the winter of 1917–1918 and found that it was cured by cod-liver oil.

There is a great amount of clinical evidence of the very valuable action of cod-liver oil in all the above cases; in none of them is a similar effect produced by vegetable fats, and the only probable explanation is that the specific action of cod-liver oil is due to its high content of vitamin A.

The most striking results with cod-liver oil have been obtained in the starving populations of Central Europe, but there is strong evidence that lack of vitamin A is an important factor in producing disease in urban populations under normal conditions.

Vitamin A is widely distributed in nature and can be easily preserved in fats, but various causes have led to its gradual elimination from the food of the people.

This vitamin is contained in whole-meal bread and in butter, but is absent from white bread and margarine. The whole milk of grass-fed cows contains large amounts, but less is contained in the milk of stall-fed cows. The quantity is diminished by boiling; it occurs in diminished quantities in condensed and dried milk, and skimmed milk contains very little. Vitamin A occurs in fresh meat, but tinned meat contains little or none.

A diet of white bread, margarine, jam, and salt fish or tinned meat is therefore almost free from vitamin. The chief sources of vitamin A in a normal diet are green vegetables, eggs, butter, milk, and meat fat.

The effects produced upon adults by deprivation of vitamin A are uncertain; the chief effects of deficiency of this vitamin are observed in babies and children, but they can be noted also in women during pregnancy and lactation.

Deficiency of vitamin A is the probable cause of rickets and osteomalacia, and is very possibly an important cause of dental caries and of impaired growth. The recruiting results in the war suggested that the urban population of England is undergoing physical degeneration, and if this view is accepted, an important contributory cause may be found in vitamin deficiency.

The clinical results recorded with cod-liver oil show that it must be regarded as an extremely important drug, but since the whole importance of the oil is due to its vitamin content, only those preparations of the oil which contain large quantities of vitamin can be considered as therapeutically active.

Hitherto the efforts of the manufacturers of cod-liver oil seem to have been directed to the preparation of as purified and tasteless a product as possible, and no regard has been paid to the vitamin content.

Zilwa and Miura found that crude cod-liver oil contained no less than 250 times as much vitamin A as butter, but that the refined oil contained much less vitamin, although its activity was superior to that of butter. The vitamin of cod-liver oil is fortunately fairly resistant to chemical treatment, and a degree of heating and oxidation sufficient to destroy all the vitamin of butter does not deprive cod-liver oil of all its vitamin.

The estimation of the therapeutic efficiency of cod-liver oil is at present a very difficult matter, for the qualitative demonstration of vitamin A takes over three weeks, and the quantitative estimation takes several months.

Two samples of cod-liver oil are now before us. Both are excellent preparations in that they are of a good colour, of pleasant taste, and give all the correct reactions of cod-liver oil, but unfortunately these facts give no information about the all-important question of vitamin content.

The manufacturers of the Gadus cod-liver oil claim that the purity of their compound is due to the fact that the livers are treated on the same day that the cod is caught, and point out that as the fishing is conducted in the cold weather any chance of putrefaction is prevented. Such precautions are of obvious advantage, since they tend to reduce the amount of treatment necessary to produce a palatable oil.

Messrs. Allen and Hanburys have also sent us a specimen of cod-liver oil, of pale colour and very slight odour and taste. It is, they say, prepared from fresh, carefully selected cod livers, with the minimum of exposure to oxidation, which they recognize tends to diminish the amount of vitamin A.

Cod-liver oil may be crude and unpalatable owing to one of two causes: the oil may have undergone no refining process, and therefore contains the full vitamin content; on the other hand, it may be unpalatable because excessive putrefaction of the livers has been allowed to occur before extraction, so that the resulting oil is so impure that it cannot be fully purified; such an oil will probably contain no vitamins at all. This point is of some importance, because it must not be assumed that the vitamin content of an oil is necessarily indicated by its dark colour and high flavour.

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WHAT IS TO BECOME OF MEDICAL STUDENTS?

THE first words of an address entitled "What becomes of Medical Students?" delivered by Sir James Paget at St. Bartholomew's Hospital in 1869, were: "It is said that, on entering the anatomical theatre for one of his introductory lectures, Mr. Abernethy looked round at the crowd of pupils and exclaimed, as if with painful doubt, 'God help you all! What will become of you?'" To-day we may ask Abernethy's question with even more anxiety, for the number of medical students in England and Scotland has increased during recent years at a great rate.

A correspondent in South Africa, whose letter is published elsewhere, thinks that the public ought to be made to understand that the numbers of medical students who are coming forward threaten so to overcrowd the profession that it will become difficult for many of them to make a living. The risk of overcrowding may be particularly evident in South Africa, but the remarks of the President of the General Medical Council in several of his recent presidential addresses are sufficient to show that it exists also in Great Britain. In 1913 the total number of new registrations on the *Students' Register* was 1,480. In 1914 it was 1,600; in 1915 it was 1,935 (of these, 456 were women). In his address to the Council in May, 1919, the President stated that between May, 1918, and January, 1919, the number of first year students had increased from 2,043 to 2,907; in his address on May 24th, 1921, he informed the Council that "the registrations of medical students, which in 1919 rose to 3,420, fell in 1920 to the more manageable number of 2,531." He added that the number was still higher than in any year prior to 1919, and stated that in his opinion "it would be in the interest of sound professional education were the numbers still further reduced. They impose a severer strain, educational and financial, on the schools and hospitals than the necessary recruitment of the profession demands, and in present circumstances the teaching institutions are less able to meet the strain. To raise the educational standard for admission and to increase the fees for professional tuition would thus seem, from all points of view, to be prudent and justifiable."

The over-pressure in some schools has been very serious; in certain of them the classes have had to be duplicated, and in Glasgow we believe it has been necessary in some subjects to give the same classes and deliver the same lectures three times over. Sir Donald MacAlister is particularly interested in this aspect of the matter, as becomes the Principal of a University and President of the General Medical Council, which is concerned with education; but to others the probable effect of so large an influx into the profession on its fortunes in the next generation may well seem of at least equal importance. When every allowance is made for the increase which has taken place in the number of appointments available to young medical men and women the prospect still seems distinctly discouraging. A salary which may appear adequate or even liberal at the age of five-and-twenty or thirty, begins to present quite a different aspect ten or fifteen years later. We are very much afraid of the multiplication of these blind alleys, and look forward with apprehension to a time when the intra-professional competition may be so serious that men and women who have once entered one of these alleys may feel compelled to pursue their monotonous path to old age. This will be good neither for the profession nor for the public.

VENEREAL DISEASE CLINICS.

THIS is an age in which it is common to witness attempts to combine two incompatibles—campaigns and economy. Campaigns are the most effective means of attracting public attention, but they are costly. Therefore, in reviewing the report Colonel L. W. Harrison and Dr. F. N. K. Menzies have drawn up on the joint venereal disease scheme for London and the Home Counties, which has been in operation for four years, we must be pardoned if our admiration for the strenuous work they have done in the investigation of the clinics is tempered by some thoughts on the subject of economy. It is easier to go with the stream of enthusiasm than to throw out hints that rocks lie ahead. We write in a spirit of sympathy, and if we sound a warning note we hope at least to be impartial.

Colonel Harrison, who was nominated as the representative of the Ministry of Health, and Dr. Menzies, who represented the London County Council, set forth in quest of information on the working of venereal disease clinics. The inquiry might have been undertaken for two somewhat different purposes: The inquiry might have been directed to ascertaining how far these clinics were contributing towards the elimination of venereal diseases, or it might have been limited to the question whether the clinics were dealing satisfactorily with individual patients. We gather that the investigators chose the first object. But the elimination of venereal disease is a task of such magnitude, and in the opinion of many so doubtful of attainment within a measurable time, that its adoption is bound to raise at once the question of the economic position of this country. Moreover, the matter is complicated by the existence of two schools of thought with regard to the prevention of these diseases; so that a public authority which embarks on a campaign with prevention as its aim has the difficult task of avoiding the appearance of indulging in propaganda. In the document before us the question of self-disinfection and ablution centres is definitely ruled out; but support is given to what is described as an established fact—that by early and efficient treatment venereal disease can be brought under control and reduced within narrow limits. It is from this point of view, therefore, that the publication of the London County Council must be considered.

The investigators seem to have come very early to the conclusion that the present conduct of the clinics in London is inadequate to achieving the purpose of exterminating the scourge of venereal disease. The reasons they give may be grouped under three headings, according as they arise from (*a*) defects in organization, (*b*) inexperience of the staffs, (*c*) idiosyncrasies of the patient.

Defects in organization are stated often to be due to unsuitable premises, with the result that the time and energy of the medical officer are wasted, while the patients suffer the inconvenience and discomfort

of waiting long periods for treatment. In many instances also these defects prevent privacy in examination. A case is quoted of a single room in which some patients were waiting, others were having instruments passed, others were having prostatic massage, and the remainder were irrigating. Another defect is found in the limitation of the hours for attendance of the patients, which leads to overcrowding and to hasty work by the medical officer, and also precludes what is called intermediate treatment. Where the clinics are conducted in the out-patient departments of hospitals the premises are available only at certain hours on certain days in the week. In many clinics no provision is made for attendance on Saturdays; and no clinics are available for any form of treatment on Sundays. The investigators throw doubt also on the value of the practice of seeing cases of venereal disease at the same time as patients suffering from other diseases, such as skin diseases or genito-urinary and gynaecological conditions, but this plan was strongly recommended in the early days of the establishment of clinics. With regard to the staffing of clinics the report is somewhat severe. It is stated that there has been an unfortunate tendency in some cases to regard the position of medical officer to the clinic as the rightful possession of one or more members of the honorary staff, without regard to their ability to do the work properly or to give up the necessary time to it. The investigators deprecate also junior and insufficiently experienced medical officers as assistants, and express the opinion that the time has come to establish the venereal disease department as a specialist department, comparable to ophthalmological and radiological departments. Adverse comments are made on the failure of many members of the staff to record results and to make statistical returns, and on the fact that the majority of medical officers had no clearly defined standard of cure.

As is usual in all systems aiming at ideal perfection—at what the authors describe as 100 per cent. efficiency—that very human person, the patient, is largely responsible for upsetting official calculations. This he does by irregular attendance, by disappearing at an early stage of treatment, by wandering about the world or the country if he is a seaman, a commercial traveller, or a race-meeting follower, and by attending two or three clinics at the same time (on the principle that you cannot have too much of a good thing). A case of this kind which had its amusing side was that of an in-patient at a hospital, who was allowed out two afternoons each week. He utilized his time by putting in attendances at another clinic! At least 30 per cent. of the patients fail to complete the course of treatment. Attempts to track down the defaulter usually lead to the discovery that he has left a false name or address or both; and even where successful the process has been found to have a prejudicial effect on the attendance of patients.

Dr. Menzies has not attempted to summarize the recommendations he and Colonel Harrison would make for meeting these difficulties, but they lay stress on "maximum efficiency" as the goal, than which they say there may be no other under the public health venereal disease scheme. The object of the clinics, they submit, must be to attract for treatment the maximum number of infected persons; the staff must work with a minimum waste of time and energy; intermediate treatment by nurses and orderlies must be given; the staff must be under one head; the hours of attendance must suit the convenience of the patients; the patients must be rendered permanently non-infectious. One clinic—that at St. Thomas's Hospital—is held up as a model in fulfilling these requirements. We gather that the authors' recommendations are as follows: All the clinics should be organized on lines similar to those obtaining at St. Thomas's Hospital. Difficulties with regard to capital expenditure should be met by arrangements for the provision of capital grants. The clinics should be open from 8 a.m. to 10 p.m. on weekdays, with provision for intermediate treatment on Sundays. The staff should consist of expert specialists, with specially trained nurses and orderlies. A scale of remuneration for medical officers should be fixed. Treatment, records, statistics, tests of cure, should be standardized. Rescue workers and various voluntary bodies should be brought into the scheme. Reception houses and hostels for girls should be established, a period of residence possibly as long, in individual cases, as eighteen months or two years being contemplated. Finally, the introduction of a system of education and training in the hostels is advised.

In contemplating this comprehensive and ambitious scheme for the extirpation of one of the scourges of mankind, filled with astonishment at the labour which must have been spent in compiling this report, and with admiration for the ideals of its authors, we feel diffidence in venturing any criticism. The authors imply that for the efficient treatment of venereal diseases highly trained specialists are necessary. But provided the clinic be well equipped and organized, is this indeed the case? The work of treating the early communicable stages of these diseases tends to become a matter of routine; the scope for initiative is small. Therefore we are not so sure of the unwisdom of that hospital which changed the staff of its clinic annually. Is it not also illuminating that the provision of teaching facilities in the clinics has proved a failure? There is no doubt, say the authors, that, broadly speaking, the medical practitioner and the medical student take very little advantage of the facilities available. Both practitioners and students attend occasionally, perhaps two or three times, and then disappear. Can it be that the experience on those two or three occasions has failed to create a desire to give up some weeks or months to the continuous study of the diagnosis and treatment of venereal disease? The main question, however, is whether the extermination of venereal diseases by means of clinics is so certain as to justify the standardization of the work forthwith, at whatever cost to the community. May it not happen that a little diversity of method at different hospitals may lead to further discoveries in a field not as yet completely mapped out? At the same time it is most proper to circulate information of what is achieved at successful clinics; in calling attention to the work at St. Thomas's Hospital this report is undoubtedly most valuable. The example should stimulate to better efforts elsewhere. The report is, perhaps, a little out of the common in that it dwells on the importance of rescue work as a possible means of preventing the spread of venereal disease. Whether it is wise to embody in the report of a public authority stories from the diaries of rescue workers, and to point the moral of these stories with quotations from *Downward Paths* and Flexner's *Prostitution in Europe*, is another matter.

However these things may be, we come back to our original theme, the incompatibility between campaigns and economy. And in this connexion we turn to the thought of Sir Eric Geddes and his committee of business men. Suppose for a moment that the London County Council Health Department were one of the ministries. The Economy Committee on entering

would be introduced to a number of interesting and desirable health schemes. There would be a housing scheme, a tuberculosis scheme, an infant welfare scheme, a venereal disease scheme, a school clinic scheme, possibly a municipal hospital scheme. Each scheme has presumably been evolved in some sub-department; each has possibly emanated from a different brain, and is all-important to its author; each has a staff of clerks, typists, and other subordinates to foster its development. Would Sir Eric Geddes be able, by docking the salary of a minor official or two, to make any important economy? Or would it not perhaps be necessary to massacre some of these innocents? We have no desire to belittle an excellent movement in regard to venereal disease. We have the greatest admiration for the conscientious work of Colonel Harrison and Dr. Menzies. But we hold it to be our duty to point out that the campaign against venereal disease is only one of many campaigns; that the proposals of the report would be costly if attempted with any thoroughness; that economy in our public spending departments is supposed to be essential at the present time; and that consequently there is some need to walk warily with regard to these schemes. On the whole, we think that the authors of the report would have shown more worldly wisdom had they restricted their investigations to the smaller question whether the venereal diseases clinics are dealing satisfactorily with individual patients.

THE TEACHING OF MIDWIFERY AT LEEDS.

THE great importance of a sound knowledge of obstetrics and the acquisition by the student of practical experience under skilled instructors has been inculcated by the recommendations of the General Medical Council and is being given a fuller measure of recognition year by year in the various teaching centres. The development of the teaching in practical midwifery in the Leeds School is therefore of interest. Prior to 1885 most of the students obtained certificates of having attended the requisite number of labours from a private or from a Poor Law practitioner; some few went to special lying-in hospitals, such as the Rotunda in Dublin. In 1885 the Leeds General Infirmary, at the special request of the teaching body, started an extern maternity district and special wards for gynaecology. This department was placed under the charge of the late Dr. James Braithwaite, and a resident obstetric officership was also instituted, the first occupant of the post being Dr. E. O. Croft, who is now the Professor of Obstetrics in the University. The development of the new extern department was carried out by Dr. Croft, and no one who is acquainted with his early administrative efforts can be unmindful of the great benefit his work conferred upon the school. In this way the students had no difficulty in securing the necessary number of cases, but more than a mere compliance with the regulations was secured and the teaching was sound and eminently practical. Special obstetric cases were admitted into the infirmary gynaecological beds, though this practice was not encouraged. In 1905 the Hospital for Women equipped and worked a small in-patient department, six beds being reserved for difficult and complex cases. This was utilized for the instruction of the students and was recognized by the University; it provided a valuable addition to the teaching facilities. About the same time there was started in Leeds a new charity, the Leeds Maternity Hospital. Beginning in a small way with 15 beds, it has grown to a well-organized and well-housed institution, and takes its place among the recognized charities of the city. The present building was opened in 1910 with 33 beds, which have now increased to 70. During the year ending December 31st, 1920, 1,314 births took place in the hospital, but as a certain number of patients are admitted for complications directly arising from delivery, the number of patients treated was 1,540. In connexion with the hospital there are at present five district homes in different parts of the city through which the extern department is worked; the confinements in the extern department have numbered 1,366. The average daily number of patients in the hospital has been 70.16, and during the seven months of the present year it has risen to 70.50. The hospital has taken an active part in the training of midwives. The number of such pupils admitted during 1920 was 98, and the certificate of the Central Midwives Board has been gained by 83. As an indication of the appreciation the teaching has won, it may be mentioned that the General Infirmary has instituted twenty scholarships which are allotted to selected nurses to enable them to undergo a course of study and work at the Maternity Hospital. After this hospital had been in existence for some years its value as a teaching centre was grasped, and its governors felt that the more it was used for teaching, and the more it was identified with the work of the Faculty of Medicine, the better would its position become. The attendance of students, at first purely voluntary, was made a part of their regular education, and all are now required to attend the intern Maternity Hospital practice for a period of one month before doing their work in the extern department of the infirmary. It has been arranged that this extern department of the infirmary shall be handed over to the Maternity Hospital, whose work will therefore in this respect become considerably enlarged. The same applies to the intern maternity department of the Women's Hospital, so that centralization, which is one of the great Leeds ideals, will be secured. The matter therefore now stands as follows: the University has entered into an agreement with the Maternity Hospital to undertake the practical teaching of obstetrics. A resident obstetric officer and tutor has been appointed to carry on the work of instruction on behalf of the University under the direction of the honorary staff, of which the Professor of Obstetrics is *ex officio* a member, in association with the Dean of the Faculty of Medicine. To this joint position the University and the hospital, who work together in this respect, have appointed Mr. Lane Roberts, M.S.Lond., F.R.C.S., who comes to Leeds with a first-class record. It is fully grasped that it will soon be necessary to appoint a junior resident at the Maternity Hospital, and this post will afford a valuable opportunity for young newly qualified men and women to qualify for the senior position in Leeds or elsewhere or to gain experience before settling in general practice. Before the scheme can be regarded as complete even on its present small scale, it is fully understood that accommodation must be secured in the immediate neighbourhood of the hospital for the students during the time they are attending the intern work of the charity.

PROTECTIVE INOCULATION AGAINST TYPHUS AND SCARLET FEVER.

THE second number of our new contemporary, the *Japan Medical World*, contains two interesting articles—one on experimental protective inoculation against typhus, and the other, putting into practice the principles enunciated in the first article, on prophylactic inoculation against scarlet fever in man. From two years' work, involving experiments on more than 200 Japanese monkeys, Kusama[1] has found that the incubation period of typhus fever in monkeys varies according to (1) the method of injection, (2) the virulence, and (3) the amount of the virus employed, being shortened by intravenous injection, high virulence, and a large dose of virus. Further, the severity of this artificially produced disease varies inversely as the

[1] Kusama, *Japan Med. World*, Tokyo, 1921, i, No. 2, pp. 1-4

length of the incubation period, so that a sufficiently small dose will prolong the incubation period, cause a very mild reaction or none at all, and confer a certain degree of active immunity. Then, employing small quantities of a virus (diluted blood of a typhus patient) which had not been rendered less active by animal passage or other ways, Kusama produced in monkeys active immunity without any preceding febrile reaction; one hundred thousandth part of the smallest dose that caused symptoms was thus capable of protecting against five times the minimum morbid dose. These observations obviously open up the way to similar prophylactic measures in man; but before this is attempted further information must be obtained as to the virulence of the infecting agent in prevailing typhus and about man's susceptibility to the virus, which is probably much greater than that of monkeys. Working on the conclusions arrived at by Kusama as regards protective inoculation against typhus and measles, Takahashi[1] has practised prophylactic inoculation against scarlet fever. Estimating the minimum amount that will produce symptoms, during the existing epidemic of scarlet fever, as 0.1 c.cm. of blood from a scarlet fever patient, he gave hypodermic injections of 0.0001 c.cm. or less of such blood to his five children, aged between 10 and 3 years; after five weeks, during which there was no reaction, four of the children were given hypodermic injections of 0.15 c.cm. of blood (the youngest received half this amount) from a scarlet fever patient, without any reaction; and later the throats of two of the children were, in addition, smeared with a mixture of faucial secretion and blood from a scarlet fever patient; here again the result was negative, though control monkeys injected subcutaneously with the same material showed the symptoms of experimental scarlet fever in monkeys.

MEDICAL EDUCATION IN EARLY NEW YORK.

IT is indeed appropriate that on the 150th anniversary of the Society of the New York Hospital's Organization, and at a time when Columbia University is much occupied in reorganizing medical education and research, two addresses, delivered, at an interval of fifty years, in 1769 and 1819, should be reprinted in their original form. Their author, Dr. Samuel Bard[2] (1742–1821), was professor not only of the theory and practice of medicine but later of chemistry, natural philosophy and astronomy in King's College, New York, which after the War of Independence was renamed Columbia University. President Murray Butler in his brief introduction says truly that these two addresses establish Professor Bard's reputation as a leader in medical education, and justify his position as prophet and seer. "The Discourse upon the Duties of a Physician with some Sentiments on the Usefulness and Necessity of a public Hospital, delivered before the President and Governors of King's College, at the Commencement held on the 16th of May, 1769, as advice to those Gentlemen who then received the First Medical Degrees conferred by that University," was humbly dedicated to Sir Henry Moore, Bt., Captain-General and Governor-in-Chief in and over the Province of New York; it warned the newly qualified that their studies, far from ceasing, were in reality but just beginning, and should be continuous throughout life. A negligent practitioner is held up as one likely to break the sixth commandment and to commit murder. Some of his injunctions, such as to avoid a blind and slavish attachment to the medical teaching of Hippocrates, coupled with the pedantry of affecting to despise the moderns, hardly applies now; but there is much sound direction as to conduct which can never be out of date, and indeed recalls the oath of Hippocrates. The advice, "whenever you should be so unhappy as to fail in your endeavours to relieve, let it be your constant aim to convert particular misfortunes into general blessings, by carefully inspecting the bodies of the dead, inquiring into the causes of their diseases, and thence improving your own knowledge and making further and useful discoveries in the healing art," is as necessary now in America as it may have been then, and, indeed, is fresh in our ears from Professor D. Drummond's recent Presidential Address to the British Medical Association. The dictum that the good effects of a hospital should not be confined to the poor, but extended to every rank, and thereby contribute to the safety and welfare of the community, has rather tardily found partial fulfilment in "group medicine." The second "Discourse on Medical Education, delivered on the sixth of April, 1819, at the Medical Commencement of the College of Physicians and Surgeons of the University of the State of New York, by Samuel Bard, M.D. LL.D., President of the College," deals with the training most suitable for an accomplished physician and surgeon. Like Dr. Walter Leaf more than a century later, Dr. Bard regarded the elements of classical learning as the most generally and truly useful preparation for the liberal professions, not excluding merchandise, and far superior to modern languages in the formation of character—a matter of much greater consequence than utility. In a subject so intricate as medicine private study alone is of little value, and practical work is alike essential in chemistry, anatomy, and in the study of disease.

[1] Takahashi, *Japan Med. World*, Tokyo, 1921, i, No. 2, pp. 4–7.

[2] *Two Discourses Dealing with Medical Education in Early New York.* By Samuel Bard, M.D. New York: Columbia University Press. 1921. (Roy. 16mo, pp. 31; 1 plate.)

THE ORIGINATOR OF THE MOSQUITO THEORY.

THE *Archives de parasitologie*[1] dated October 31st, 1919, which has just reached us, has a very special interest, for it contains an obituary notice of its eminent founder and editor, Professor Raphaël Blanchard, and an attractive life from his pen of Louis Daniel Beauperthuy; this sympathetic account of an almost forgotten pioneer in tropical medicine can hardly fail to suggest to the reader the resemblance between the labours and mental attitudes of the two men. Professor Raphaël Anatole Emile Blanchard (1857–1919), whose handsome features and distinguished personality at once marked him out in a crowd as someone of note, was familiar to many in this country from his visits to medical congresses and meetings. At his sudden death on February 7th, 1919, within two weeks of his sixty-third birthday, he left behind a list of 603 publications covering the wide field of parasitology, hygiene, teratology, medical history, ethnography and numismatics; his untiring devotion to science was shown also by his tenure of secretarial posts, for which his wide culture and knowledge of languages undoubtedly fitted him in a pre-eminent degree; thus in 1876 he was one of the founders, and for twenty-two years (1879—1900) the general secretary of the Zoological Society of Paris; in 1889, strongly impressed with the need for international agreement in scientific nomenclature, he became general secretary of the international congresses of zoology. He was an enthusiastic pioneer in parasitology and tropical medicine, a vigorous advocate of education in these subjects, and the active mover in the establishment in Paris of an institute of colonial medicine. In 1908 Aristides Agramonte, now the sole survivor of the famous Yellow Fever Commission of 1900 to Cuba, the other members being Walter Reed, James Carroll, and Lazear, drew attention to Beauperthuy as a pioneer in yellow fever research, and showed that he had anticipated Dr. Carlos J. Finlay of Havana, who, in 1881, had promulgated the theory that the mosquito transmitted yellow fever. The late C. Louis Taylor in one of his serial Nova et Vetera,[2] utilized the material provided by Agramonte, and remarked that there is some truth in the saying that no accepted discoverer, whether in the world of science or of travel, is really the first in the

[1] *Arch. parasit.*, Paris, 1919, xvi, i-iv; 503-545.

[2] BRITISH MEDICAL JOURNAL, 1908, i, 1306.

field, and that in practically every case he has been forestalled by someone whose voice has failed to reach the public or has fallen on unheeding ears. In 1909 Rubert Boyce, Chauffard, and Leechman of Demerara followed suit in doing honour to this neglected worker. No doubt the idea is generally in the air some time before a discovery is made, and in 1848, or about six years before Beauperthuy made his views public, J. C. Nott of Mobile, in an article on the cause of yellow fever, disputed the then accepted miasmatic doctrine, referred to the transmission of disease by insects as no novelty, mentioning Kircher (1659) and others as supporters, and reviewed a number of facts characteristic of yellow fever and malaria that were explicable only on the hypothesis of insect transmission. Beauperthuy was born in Guadeloupe in 1807, and was so drawn to natural science that he interrupted his medical course in Paris for four years (1833–37) to work at insects in South America. In 1839 he read his inaugural thesis on climatology, in which he insisted that the most important factor modifying the human system was climate, and put forward views which, then somewhat heretical, have now long been accepted. Then for about three years he worked as a travelling naturalist in America, and his labours and struggles are well told by his letters and long lists of objects, ranging from fossils to living animals, that he transmitted to the Paris Museum of Natural History. In 1841 he abandoned his favourite work and started practice in Venezuela, becoming professor of medicine and surgery at Cumaná; there he worked at malaria, yellow fever, dysentery, and leprosy; his reputation in the treatment of the last mentioned by frequent baths, generous feeding, a liniment of cashew nut and mercury internally, gained him the post of director of the Leper Hospital in British Guiana, which he held till his death in 1871. His conclusion that yellow fever is not contagious, but is transmitted by the bites of mosquitos, was published in 1854; he, however, believed that a poison, not a germ, was thus conveyed. In the following year he argued that cholera was also due to the bite of a nocturnal insect. In dealing with malaria he controverted the popular belief in miasmas, and insisted that marshes were dangerous because they bred mosquitos, drily remarking that miasmas are chimerical. Blanchard compares Beauperthuy's views as to the transmission of yellow fever, malaria, and other diseases by the mosquito with Sir Patrick Manson's description of the mosquito's part in the transmission of filarial disease, and it will be remembered that Manson prophesied that malarial infection would be proved to be similar in its mechanism. Beauperthuy believed that leprosy was transmitted by various insects; it is interesting that his biographer, quite unaware of this, independently came to the conclusion, some thirty years after Beauperthuy's death, that this disease is transmitted by the bite of mosquitos. Beauperthuy left a voluminous manuscript which was not published for twenty years and then suffered from the editing of his brother and son, neither of whom were medical men. Blanchard paid a high tribute to his scientific enthusiasm, and defended his claim to be the originator of the now accepted theory that yellow fever and malaria are transmitted by mosquitos.

A LEGISLATIVE PROPOSAL FOR THE PREVENTION OF VENEREAL DISEASE IN LIVERPOOL.

IN his annual report for 1920 Dr. E. W. Hope, the medical officer of health for Liverpool, deals in a very sensible manner with the question of the prevention of venereal diseases. He points out that for obvious reasons they cannot be controlled merely by adopting the same measures which have been found to be successful in the case of other infectious diseases. Moreover, measures of control which may be suitable for a moderate-sized inland town or a health resort would be inadequate for a great town or large seaport or a military or naval centre. The promotion of a private bill by the Liverpool corporation was thought to be an opportunity for obtaining fuller powers than already existed for dealing with these diseases, and draft clauses having this end in view were approved by the parliamentary committee of the corporation. Apparently, though we are not told why, they were not included in the bill when it was introduced. The main provisions in the draft clauses would have made it incumbent upon every person who knows that he is infected with venereal disease to consult a doctor and to conform to his requirements; would have facilitated continuity of treatment until freedom from infection was achieved; would have made it the duty of parents or guardians of feeble-minded infected persons or of infected persons under 16 years of age to place them under treatment; and would have made it a penal offence for any person knowingly to infect any other person with a venereal disease. The maximum penalty suggested was a fine of £100 or imprisonment with or without hard labour for twelve months or both penalty and imprisonment. There are already in active operation in Liverpool free venereal clinics at five of the hospitals in the city, and two were established nearly three years ago. During 1920 there were treated at these five institutions 6,227 new cases. Of this number 61 per cent. were discharged soldiers and sailors, and 37 per cent. of the total number were seafaring people; 15 per cent. of the latter were not natives of the British Isles. The experience of the clinics in Liverpool is the same as that of clinics elsewhere—namely, that though the facilities for treatment are very fully used, yet there is great difficulty in getting patients to continue treatment until they are cured or free from infection. The abortive proposal of the Liverpool parliamentary committee would have made this discontinuance an offence, but the difficulties in the way of enforcing such a provision are so great that it is doubtful whether at the present time any good purpose would be served by such legislation.

THE NATIONAL INSTITUTION OF INDUSTRIAL PSYCHOLOGY.

MEASURES for combating infant mortality, for early dental treatment to prevent the otherwise inevitable occurrence of disease, hygienic housing, and a more congenial and healthy environment are all calculated to raise the standard of national efficiency. But given all these things, the problem still remains of how best to provide full scope to the potentialities of workers; and here the problem is a psychological one. An individual may be well enough suited to a particular occupation, but unable to give sufficient play to his inherent bent in any other, so arises the need for "vocational guidance." This can be achieved only by the detection of specific propensities; and to effect this psychological investigation applied to industrial problems is required. The aim is the utilization to the fullest extent of individual capacity. Dr. C. S. Myers, F.R.S., who is Director of the Psychological Laboratory at Cambridge, is recognized as a pioneer in this important work, and it is to him that the inauguration of the National Institute of Industrial Psychology is mainly due. It is conducted at 329, High Holborn, London, and has already established a wide field of activity. The chiefs of the various university and technical college laboratories, whose attention has already been engaged on this matter, have formed a scientific committee to co-ordinate the experimental work done in various departments. Psychological problems which have already arisen in various industries have been submitted to the institute for investigation and advice. A course of training has been initiated for the benefit of welfare workers, on whose appreciation of the psychological factors concerned in the manifold problems encountered much of the success of work of this kind must depend. We have no doubt that the results of future investigation will justify the initiation of this institute and hasten the solution of problems which hitherto have been a bar to national progress.

THE MEDICAL OFFICER OF HEALTH OF THE CITY OF LONDON.

A CURIOUS position has arisen in connexion with a proposal of the Common Council of the City of London to increase the salary of Dr. W. J. Howarth, C.B.E., their medical officer of health, from £1,500 per annum to £2,000. A motion to this effect was duly carried at a meeting of the Council by 84 votes to 64, but the Town Clerk subsequently stated that a two-thirds majority was required. His ruling appears to have been disputed, and the whole question was referred to a special committee with authority to obtain counsel's opinion. We shall await with interest the report of this committee, who must of necessity be guided in the decisions they arrive at by the purely legal aspect of the question. As to whether an important official such as the medical officer of health of the City of London should be in receipt of the higher salary named there cannot be two opinions, and the present holder of the office has a reputation which fully entitles him to it. This is the view apparently held by a substantial majority of the members of the Council, and it would appear to be singularly ungracious to refuse Dr. Howarth his due on a mere technical point which, in all probability, was never intended to apply to circumstances such as those to which we have referred.

ASSOCIATION OF BLIND MASSEURS.

THE Council of the Association of Certificated Blind Masseurs has issued its second annual report describing the work of the association for the year ending June 30th, 1921. It has 146 members, of whom 88 are blinded soldier masseurs, 30 civilian masseurs, and 28 masseuses. Under the charter granted to the Chartered Society of Massage and Medical Gymnastics provision was made for the appointment of a special standing committee for the blind to ensure careful consideration of all matters relating to or affecting blind masseurs and masseuses. The committee consists of six persons—three nominated by the Council of the Chartered Society, and three by the Council of the Association of Certificated Blind Masseurs. A certain proportion of the cases treated by the members of the association have been directly allocated to them from among those applying to the secretary, but the majority have been sent by medical men who have become acquainted with the work of the association. We are confident that that work has only to be better known to ensure a steady flow of work. Judging from the statement of accounts, the association is very economically managed, but the funds are small, and the Council may well feel some anxiety as to the best method of advertising; in this respect it is helped by St. Dunstan's and the National Institute for the Blind. Probably the most efficient method would be by frequent short advertisements giving the address—224, Great Portland Street, London, W.1.

THE SHROPSHIRE ORTHOPAEDIC HOSPITAL.

THE Orthopaedic Hospital founded at Baschurch by Miss A. G. Hunt, R.R.C., in 1900, having outgrown the improvised premises where so much good work has been done during the last twenty years, has been removed to the buildings formerly known as the Park Hall Military Hospital, Oswestry. The site cost £1,390, and the buildings and equipment £26,000. The British Red Cross contributed £25,000 towards the cost of the buildings and equipment, and a sum of £9,000 was set aside by the Shropshire War Memorial Committee. The new buildings were formally opened on August 5th by the Marchioness of Cambridge. Lord Kenyon, treasurer of the hospital, said that there were at present about 200 children and about 100 pensioners in the hospital. Miss Hunt's name was world-renowned, and though the hospital had been transferred to Park Hall, and was known as the Shropshire Orthopaedic Hospital, it would never lose the name of Miss Hunt's Hospital or the memory of the work done at the surgical home at Baschurch. It now had about eighty patients from Shropshire, but there were others from Cumberland, Cheshire, Lancashire, Derbyshire, Warwickshire, Devonshire, Staffordshire, Oxfordshire and London. The hospital, it was hoped, would be a permanent institution, and become the greatest open-air children's hospital in the kingdom. Sir Robert Jones, honorary surgeon to the hospital, in the course of a very brief speech, said that the hospital was becoming a national institution. The home at Baschurch was really the first open-air hospital in the world. From every country visitors had come to watch its operations and learn how the work was done there. During recent visits to America he had seen hospitals which had been built and were worked on the same lines as those on which his friend Miss Hunt had done her orthopaedic work. Miss Hunt would not rest until she had set this hospital on its feet, and had fired its executive with her own enthusiasm; he was convinced that there was a promise of a great future for it. There were very many cripples to-day, but there hardly need be one cripple if united efforts were made. The charm about the Shropshire scheme, which he hoped would grow into a national scheme, was that when the patients left the hospital they were treated at a number of clinics in various parts of the county. In this way patients after discharge were followed up and guided to recovery. In the past it too often happened that when a child had been made straight in a hospital and went back to the courts and alleys of cities the continuity of treatment was lost and the disease or deformity which had been arrested recurred.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Criminal Law Amendment Bill.

THE report stage of this bill was taken in the House of Commons after 11 o'clock at night on August 4th, and was completed shortly before 3 o'clock a.m. on August 5th.

At the instance of Mr. Macquisten, a new clause was added making any act of gross indecency between female persons a misdemeanour, punishable in the same manner as any such act committed by male persons under the Criminal Law Amendment Act, 1885. Dr. Farquharson accepted the clause on behalf of the promoters of the bill.

On Clause 1 (consent of young persons under the age of 16 to be no defence) Sir Robert Newman moved to omit the words, "But the party so consenting shall be guilty of a misdemeanour if he or she is of the age of 15 years." This amendment was defeated by 167 votes to 27.

Sir E. Wild proposed the rejection of Clause 2—that reasonable cause to believe that a girl was of or above the age of 16 should not be a defence to a charge under Sections 5 and 6 of the Criminal Law Amendment Act, 1885. Major Hamilton, seconding the amendment, said his principal reason for doing so was his experience as a commanding officer in charge of poor working boys. He told the House what nineteen soldiers had suffered from association with two girls, 15 and 16 years of age, whom both the medical officer and himself were satisfied looked as if they were 18, 19, or 20 years of age. The Home Secretary (Mr. Shortt) strongly supported the retention of the clause. The whole purpose of this measure was, he said, for the protection of the young, and it was one of the objects of the bill to protect girls of 15 who were so developed as to look like 17. In the course of the further discussion Dr. Farquharson, speaking as a physician, said he had seen over and over again the most deplorable mental and physical wrecks, due to early promiscuity. He appealed to the House to let the clause stand as a physical protection to the race. On a division the clause was retained by 103 votes to 49.

On the motion of the Solicitor-General for Ireland, an addition was made to Clause 7 (short title) to bring Ireland within the scope of the measure.

The third reading discussion followed on report. After a few speeches the closure was carried by 106 to 15 votes, and the bill was then read a third time by 101 votes to 6. Dr. Farquharson announced the figures as one of the tellers for the majority.

National Insurance: Suggested Inquiry.

Mr. Haydn Jones asked, on August 4th, whether the working of the panel system under the Health Insurance Act was causing dissatisfaction, and whether the Minister

was prepared to consider the desirability of appointing a committee to inquire into and report upon the working of the system. Sir A. Mond said he had no information that the working of the system was generally causing dissatisfaction, although in a scheme of this magnitude a certain number of complaints would arise. Machinery was provided under the regulations for investigating complaints and imposing penalties where such complaints were substantiated. He would be glad to look into any specific cases which Mr. Jones might desire to bring under his notice. He was considering whether the time had not come for an inquiry into the working of the Act as regards both cash benefits and medical benefits.

Medical Officers of the Ministry of Pensions.

Major Tryon informed Mr. Hayward, on August 4th, that 317 whole-time medical officers were employed at the Ministry, partly or solely on administrative duties. Their annual salaries, inclusive of all emoluments, amounted to £316,255. Of these, however, 75, while holding administrative posts, were engaged for a large part of their time in visiting or examining and arranging for the treatment of pensioners, and some considerable portion of them were, and had to be, officers with specialists' qualifications. Three hundred whole-time doctors were employed solely in the treatment of pensioners. Their annual salaries, inclusive of all emoluments, amounted to £220,108. In addition, the Ministry utilized the part-time service of 653 medical officers and specialists in connexion with treatment at hospitals, limb-fitting centres, and clinics, at a total annual cost of £210,558. There were also 1,717 medical referees, paid on a fee basis, who were employed in examining and certifying patients for treatment.

War Pensions Bill.

On Report on the War Pensions Bill in the Commons on July 28th, Mr. Trevelyan Thomson moved an amendment to Subsection 2 of Clause 1 to make it compulsory that before issuing any order for the establishment of war pensions committees the Minister of Health should consult persons and bodies affected thereby, including local committees. The intention was to reduce the administrative machinery of pensions by cutting down the number of committees from 1,200 to 400, and he was anxious that the Minister should discuss with the committees questions of area on reorganization. Mr. Macpherson said the gist of the arguments advanced by members was that he should consult all local interests, and he had agreed to do so, but he could not accept Mr. Thomson's first amendment. On a division it was rejected by 127 votes to 40.

On Clause 4, under which any person dissatisfied with a final award may at any time within one year from date of notice of the award appeal to a pensions tribunal to set aside or vary the award, Mr. Griffiths moved to alter one year to two. He urged that the shorter period might produce some very hard cases. For instance, a person suffering from tuberculosis might be in the first stage when he had his final award. He might follow his employment during the first twelve months, but later the disease might develop, yet his final award would have been only of 25 per cent. or 50 per cent. disability. Mr. J. Guest, in seconding the amendment, said that the Labour Party welcomed the system of final award, because the men had become dissatisfied with the repeated medical examinations, but which they had to face. There was a danger in the case of complaints liable to recur, such as neurasthenia or tuberculosis, or even in the case of wounds in which trouble might break out again after a long period; there should be a sufficient period after the final award during which a man might be entitled to have his case reheard. Twelve months was a comparatively short time in the history of some of these diseases, and it would give confidence if the period could be increased to two years. Major Tryon, in reply, said the medical boards were necessary because for a long time the men were getting better or worse, and if these boards were not available, men who were getting worse would not get higher pensions, and men who were getting better would retain pensions to which they were no longer entitled. The final award was not made by a medical board until the end of four years, and at that period a large number of pensions must be finally settled. A man suffering from tuberculosis who was obviously getting worse would not be given a final pension. His case would be left open, as would any other case thought to be getting worse, and under a warrant whereby he was given full statutory right he would get full treatment allowance, hospital allowance, and allowance for his wife and children, should he, with a small permanent pension, become incapacitated and be placed in a hospital. The two years proposed by the amendment would be far too long. If it were desired to prolong the period before finality was reached to six years, it would be better to give five years before the final award and have only one for appeal. If the appeal were left open, a man might be engaged in an unhealthy occupation, the Ministry might lose touch with him and have no record of his medical history in those two years. The men themselves might run some risk, because if they were found to be better and they appealed they would lose pensions which they would have retained if they had been content with what they had got. On a division the amendment was rejected by 109 votes to 33.

Regional Medical Officers.—Sir J. Harmood Banner, on August 2nd, asked how many regional medical officers had been appointed by the Ministry of Health; the functions of such officers; and whether their appointments would in any way prevent direct access by the local authorities to the Ministry. Sir A. Mond said that thirty-three regional medical officers had been appointed, and of these one had died, and the vacancy had not been filled. These officers acted as medical referees on questions of incapacity of insured persons for work referred to them by the approved societies or raised direct by insured persons. In addition they acted as consultants to insurance practitioners, and generally assisted in maintaining the efficiency of the insurance medical service. They did not prevent access to the Ministry.

Pre-war Disability Pensions.—Sir J. Davidson asked, on August 3rd, when the new scale of pre-war disability pensions would be promulgated. Sir Robert Horne assumed the reference to be to pre-war life disability pensioners who served during the great war, excluding the former war pensioners and men again invalided who had already been dealt with on the great war scale. If so, the answer was that the scales approved for post-war disability pensioners would be applied to pre-war life disability pensioners under the same conditions and as from the same date as the increases in long service pensions had been applied to long service pensioners, subject, however, so far as the disability element was concerned, to medical survey to determine the present degree of disability. The post-war scale was in an advanced state of consideration and would be promulgated shortly.

Shell Shock Cases.—Major Tryon, on inquiry by Mr. F. Roberts on August 4th, said that in general the Minister of Pensions was satisfied with the present arrangements made by his department for the treatment of shell shock patients; it was in conformity with the highest medical opinion. If Mr. Roberts had in mind any institution of whose proper administration he had doubt, a communication would be welcome.

Service Patients in Mental Institutions.—Colonel Wedgwood, on August 5th, asked the Minister of Pensions how it happened that, in default of any authority possessed by him to intervene in matters coming within the scope of the Lunacy Acts, a medical officer from pensions headquarters joined in the visits paid by the Lunacy Commissioners, and was invited to report on the mental condition of service patients in county asylums; and would he, in view of the admitted irregularity of such procedure, take steps to put an end to unauthorized decisions emanating from pensions officials, where such intervention was directed to the release of ex-service men from unjustified detention. Mr. Macpherson replied that the medical inspector of his department, who, by the courtesy of the Board of Control, visited mental institutions in which ex-service men were under treatment, did not intervene in any way in matters coming within the Lunacy Law, but acted solely in the interests of "service patients" as pensioners. On the particular occasion which he understood that Colonel Wedgwood had in mind it was known to the Board of Control that the Ministry inspector was about to visit the hospital, and they took the opportunity of availing themselves of his opinion on the case. Such opinion was in no sense a decision, nor was there any irregularity in the procedure of obtaining or furnishing it. The arrangements for the visiting of asylums by a Ministry official was in the best interests of ex-service men, and it was, moreover, one which was considered and approved by the recent Departmental Committee of inquiry.

Health and Unemployment Insurance Cost.—On inquiry by Sir R. Clough, Dr. Macnamara stated, on August 4th, that the normal weekly contributions from employers and employed for health insurance and unemployment insurance, where payable, were at present as follows:

	Health.	Unemployment.	Total.
	d.	d.	s. d.
In respect of men—			
Employers	5	8	1 1
Employed	5	7	1 0
In respect of women—			
Employers	5	7	1 0
Employed	4	6	0 10

In certain cases where low contributions were paid, the employer's contribution for health insurance was increased, and that from the employees was correspondingly reduced. Unemployment insurance contributions were payable at half the above rates in respect of boys and girls between the ages of 16 and 18. The State did not make the weekly contribution to health insurance, but provided two-ninths of the cost of benefit and the administration thereof. The State contribution to unemployment insurance was one-fourth of the contributions from employers and employees—that was, 3½d. weekly in respect of men and 3¼d. weekly in respect of women.

Poor Law Children.—The number of children in receipt of Poor Law institutional relief on January 1st, 1921, was 60,672. Of these there were: in sick wards of workhouses 2,365 children over three years of age, and 2,505 children under three years of age. In other wards of workhouses there were 2,553 children over three years of age, and 3,335 under three years of age. The number of children in receipt of outdoor relief, including children boarded out, on the same date was 174,097. The number of children in the following classes of Poor Law establishments for children on January 1st, 1921, were: schools, 7,429; grouped cottage homes, 11,793; scattered homes, 7,946; other separate homes and institutions for children (including a training ship), 4,224.

The Administration of Asylums.—Dr. McDonald asked, on August 3rd, if the attention of the Minister of Health had been called to a publication by Dr. Montagu Lomax, containing grave charges of inhumanity in the administration of our asylums, and as these charges were specific and the alleged inhumanity was inferred rather than witnessed by Dr. Lomax, would he cause inquiries to be made as to their truth, in order to relieve the anxiety of many of the public who had relatives confined in these institutions. Sir A. Mond replied that his attention had been called to the statement in the book. The visiting committee of the asylum at which Dr. Lomax was employed as locum tenent, and to which he evidently referred, had already been asked by the Board of Control for their observations; as soon as these had been received he would consider what further action was necessary.

National Health Insurance: Seamen.—Major Henderson asked the Minister of Health, on August 3rd, whether he was aware that the Controller of Health Insurance promised the deputation which waited upon him on July 6th that he would summon an early conference of all interests concerned to consider the advisability of improving the system of seamen's insurance. Sir A. Mond said the matter was being investigated by an office committee appointed for the purpose. Steps would be taken at the earliest possible date to obtain the views of all concerned.

Army Hospitals and Dépôts.—Asked by Captain Wedgwood Benn the reason for the increase in the working expenses of hospitals and dépôts in the Estimates for the present year, Sir L. Worthington Evans said that, in the case of the dépôts, the increase was due to the expansion of this subhead to include classes of dépôts not hitherto costed.

Milk Supplies for Tuberculous Persons.—Mr. T. Griffiths asked, on August 2nd, whether the Hertfordshire County Council, in providing milk for tuberculous persons, proposed to allow for a supply to 47 persons, in addition to the supply provided by the Insurance Committee for 153 insured persons; whether the limitation of the supply to persons with tubercle bacilli in the sputum excluded many, especially children, for whom milk was necessary; and whether, in view of the inadequacy of one pint of milk per day for the purpose, the Minister would consider withdrawing the regulation which limited the expenditure of local authorities, if they were to receive Government aid, to £2 per 1,000 inhabitants? Sir A. Mond understood that the County Council scheme provided for the supply of milk to about 200 tuberculous persons at any one time, and that this was the maximum provision which could be made within the limits of an expenditure of £2 per annum per 1,000 inhabitants of the county. The limitation of the supply to persons with tubercle bacilli in the sputum did not apply in cases of non-pulmonary tuberculosis, the majority of which were children. The Exchequer grant allowed, on the average, an expenditure of double that hitherto incurred by the Insurance Committees. He could hold out no hope of an increase in the grant.

Royal Air Force Medical Service.—Commander Bellairs asked, on August 2nd, whether the Air Council was attempting to build up a separate medical service from the army and navy. If so, how many medical officers there were; whether casualties or invalids were sent both to naval and military hospitals, or exclusively to military hospitals; and whether any hospitals had been, or were, being built for the Air Force. Captain Guest replied that a separate medical service was being built up and the number of medical officers was 124. This figure excluded medical officers employed at the Air Ministry. Casualties and invalids were sent, where possible, to the nearest naval, military, or civil hospital. No hospitals had been, or were being, built for the Royal Air Force, but Royal Air Force hospitals had been established in buildings at Halton and Cranwell, which were formerly occupied by other units. In addition a temporary hospital for officers existed at Avenue House, Finchley. The latter was a private house hired for the purpose and had not been altered.

The Certification of Insane Prisoners.—In reply to Mr. Lawson, on August 2nd, Mr. Shortt said that when the inmate of a prison became insane he could be so certified under the Criminal Lunatics Act, 1884, by two members of the prison visiting committee (who, of course, were justices) and two legally qualified medical practitioners. If the prisoner was then removed to an asylum he continued to be subject to the Act until the expiration of his sentence. If at the expiration he was still insane, provision had to be made for him under the ordinary lunacy law. This reply referred to persons certified insane while in prison, not to persons found insane by verdict of a jury on evidence.

The Licensing Bill.—In report on the Licensing Bill in the House of Commons, on August 2nd, it was decided by 175 votes to 135 to make the hours of opening licensed premises and clubs, otherwise than in the metropolitan area, on week-days, a uniform total of eight hours a day, instead of a maximum of eight hours, with a discretionary power to local justices to limit the number to seven hours. In the same way also the hours of Sunday opening were made a uniform total of seven, instead of a maximum of seven, with discretionary powers for magistrates to reduce the number.

Women Panel Doctors.—Sir Alfred Mond informed Sir Walter de Frece on August 2nd that 117 women physicians were at present acting as panel doctors in England and Wales, and the number of patients on their lists was 40,686.

Sections at the Annual Meeting.

BRIEF SUMMARY OF PROCEEDINGS.

(*Concluded from page 205.*)

SECTION OF OBSTETRICS AND GYNAECOLOGY.

THE proceedings of the Section opened on July 21st with a joint paper by Drs. J. Munro Kerr (Glasgow) and Eardley Holland (London) on the rôle of Caesarean section in midwifery. Dr. Munro Kerr took as his subject the indications for the operation, and showed how these indications had been extended in recent years and were still being extended. In early years Caesarean section had been confined to cases in which delivery of a living child was rendered impossible by pelvic contraction or tumours. Now the operation was being performed for placenta praevia, accidental haemorrhage, eclampsia, and rigidity of the cervix and vagina. The authors had collected statistical tables from the British Isles showing the results of Caesarean section for these conditions.

Dr. Holland's side of the paper dealt with the technique of the operation and with the operative mortality. He emphasized the value of operating through the lower uterine segment. A most interesting part of his paper was a table showing the excellent results when Caesarean section was done before the onset of labour or where no manipulations had been carried out. The paper was very fully discussed, most criticism being directed at the lower uterine segment incision.

This paper was followed by one on the treatment of advanced malignant disease of the cervix, by Dr. Arthur Burrows (Manchester). The paper and the discussion dealt purely with the value of radium. No other line of treatment was touched on. The results obtained by Dr. Burrows demonstrated the value of radium in the treatment of inoperable cases, and its value in tending to make apparently inoperable cases operable.

On July 22nd the session was opened by a paper by Dr. Archibald Donald (Manchester) and Dr. Farquhar Buzzard (London) on the neurasthenic element in midwifery and gynaecology. The subject was dealt with at great length by both authors. The papers did not arouse much criticism, but were followed by some personal experiences from members of a full meeting. A valuable contribution on curettage was made by Dr. H. Beckwith Whitehouse. Dr. Whitehouse emphasized that the endometrium must be looked upon as a ductless gland, possibly antagonistic in action to the ovary. He looked upon menstruation as the pro-oestrum, and thought that the local condition was produced by the uterine hormone controlled and sensitized by the ovarian secretion. With regard to excessive uterine bleeding, this was due to general or local causes, and he considered it as essential that a thorough pathological investigation of the endometrium should be held on each individual case. Herein lay the value of curettage. He emphasized that endometritis—that is, "inflammation of the endometrium"—was a rare condition, and that it was not a cause of uterine haemorrhage. Curettage only did good in treatment where something definite—such as hypertrophied endometrium, polypi, or the products of conception—was removed. The session closed with a paper by Dr. John Campbell (Belfast) on the position of the medical practitioner called in to attend a case of procured abortion. This paper raised an interesting discussion, the view being expressed by the President, Professor Ranken Lyle (Newcastle), that the position of the doctor was "that on being called to a case of abortion he should inform the patient that he could not attend the case unless the matter was reported to the legal authorities." The meetings of the Section were very well attended, particularly on the second day of the proceedings.

England and Wales.

Second Report of the Welsh Consultative Council.

The Second Report of the Welsh Consultative Council of the Ministry of Health (of which Sir Edgar Jones, K.B.E., M.P., is Chairman) has just been presented to Parliament. In its First Report the Council expressed certain preliminary conclusions as to personnel (medical practitioners, nurses, health visitors, etc.) and as to the kind of health institutions that should be available. It has since made a general survey of the existing institutional provision in the Principality, and in the Report now presented formulates proposals with regard to two main subjects: (1) The provision and the distribution in the various areas of Wales of health institutions of all kinds and grades; and (2) the local authorities which should be entrusted with the future administration of the health services recommended.

General Hospitals.

The Council finds that the total number of beds in the various kinds of institutions in Wales at January 1st, 1920, was 15,532. It is impressed by the great need for increased accommodation for the residential treatment of sick persons other than those suffering from mental disease, tuberculosis and infectious diseases; and it estimates that the existing provisions for such cases after allowing for beds in Poor Law infirmaries that could be made available, should be supplemented by an addition of at least 50 to 75 per cent. The existing distribution of hospitals, also, is by no means satisfactory having regard to the requirements of the population.

Scheme of Institutions.

The Council has drawn up a scheme providing a network of institutions for the Principality. This scheme is based on the general principles: (1) That there should be fifty-nine *Local Health Institutes* situate at specified places within convenient reach of members of the population. (In sparsely populated areas small subsidiary hospitals or centres for clinics are suggested in place of local institutes, or, in very sparsely populated areas, single clinics with, say, at least two beds.) (2) That for the present there should be established not more than four *Central Health Institutes* (situate at Bangor, Wrexham, Swansea, and Newport), and that upon these the local institutes in their respective areas should be based. (3) That at Cardiff, in association with the Welsh National Medical School, there should be a *National Health Institute of Wales*, which should serve also as the central health institute for the immediate area.

At each local institute and subsidiary hospital the cases admitted would be followed through by the general practitioner. Wherever possible this would also be done in cases admitted to central institutes. The various local institutes would differ considerably in size and importance, and in the provision of facilities. The minimum provision should, however, include (*a*) beds for general medical and general surgical cases, (*b*) a maternity ward, (*c*) various clinics (for example, child welfare, dental, tuberculosis, venereal diseases, pediatric, psychiatric) and (*d*) a hostel for nurses. These departments need not necessarily be under one roof. Attached to each of the central institutes and to the more important of the local institutes (thirty-two in number) there should be a medical institute, which should afford facilities for each medical practitioner to be brought into close contact with his fellow practitioners in team work, and to keep himself abreast with developments in medical science and practice. In close proximity to the larger local institutes and to each of the central institutes, there should be a separate block to which cases requiring care and supervision might go pending the return of the patient to vigour and health before discharge from the institution. The various clinics should be normally in very close association with the nearest suitable hospital or other institution. A suggested scheme showing the proposed location of the various kinds and grades of health institutions to meet the requirements of Wales as a whole is set forth in an appendix to the report.

Part II of the Report—to which we shall refer in a later issue—is devoted to the problem of the form of local government which should be established for administering the health scheme.

Schools for the Blind, Deaf, Defective, and Epileptic.

The Board of Education has issued a pamphlet[1] which gives a classified list of certified schools, training institutions, and technical schools for blind, deaf, defective, and epileptic children in England and Wales, and includes also a list of the boarding-out committees which have been approved by the Board under the different Acts. There are in England 39 day schools and 25 residential schools for blind children; 28 day schools and 21 residential schools for deaf children; and 175 day schools and 20 residential schools for mentally defective children. Schools for physically defective children are included under a number of separate classifications. There are 59 day schools and 13 residential schools for crippled children; 36 day open-air schools for delicate children, including children suffering from tuberculosis; 4 day schools for children in hospital who are suffering from non-pulmonary tuberculosis or other crippling conditions; 20 residential sanatorium schools for children suffering from pulmonary tuberculosis; 22 residential sanatorium schools for children suffering from non-pulmonary tuberculosis; 23 residential open-air schools of recovery; 2 residential schools for children suffering from ophthalmia; and 6 residential schools for epileptic children. In Wales there are 1 day school and 2 residential schools for blind children; 1 day school and 1 residential school for deaf children; 6 day schools for mentally defective children; 1 day open-air school for delicate children, including those suffering from tuberculosis; and 1 residential sanatorium school for children suffering from tuberculosis. There are 38 recognized institutions in England and 1 in Wales which provide full-time courses of instruction for the blind, deaf, epileptics, and cripples, in preparation for a trade, and there is one institution—the Worcester College for the Blind—which is a recognized institution for the higher education of the blind. There are in addition 4 recognized schools and classes for blind students, 13 schools and classes for deaf students, and 2 schools for physically defective students. In Wales there is one institution—the Cardiff Institution for the Blind—which is similarly recognized.

Cost of Treatment of School Children.

The London County Council has decided that parents unable to pay the fees of a private practitioner, but able and willing to pay to the Council the full cost of the medical or dental treatment of their children, shall be enabled to do so. Certain small but definite charges are also to be made to parents or guardians who cannot pay the full cost of the treatment. Hitherto the rule requiring recovery of expenditure from parents has been almost a dead letter. In 1919–20 the proportion so recovered was only a little more than 4 per cent. of the total cost. The actual cost of treatment, excluding administration, based on the estimates of 1920–21 was—on ear, nose, and throat cases £6,660, on ringworm £2,980, on minor ailments £16,170, and on dental treatment £32,610, the average cost of a case in each of these categories being respectively 8s. 5d., £1 3s. 10d., 7s. 1d., and 5s. 9d.

Central Midwives Board.

The Central Midwives Board for England and Wales met on July 28th. A special meeting was held first, and the ordinary monthly meeting followed on the completion of the former. Sir Francis Champneys presided at both meetings. At the special meeting three midwives were removed from the roll—serious faults, such as neglect in cases of ophthalmia neonatorum and puerperal fever, being among the charges proved. At the ordinary meeting a letter was read from Dr. W. E. Fothergill complaining of the inclusion by the General Nursing Council of certain midwifery subjects in its draft syllabus for education and training, and suggesting that the Board should express an opinion on the matter to the General Nursing Council. A letter from Dr. Fairbairn on the subject was also read. The Board agreed to reply that the question of the

[1] *Board of Education List of Certified Schools.* London: H.M. Stationery Office. 1921. Price 6d. net.

instruction of nurses does not fall within the scope of its jurisdiction. The Central Midwives Board for Ireland having submitted a copy of its new rules for the Board's consideration, it was agreed that, subject to the observations made by its secretary to the Secretary for Ireland, the Board was prepared to agree with them.

Scotland.

THE CHAIR OF MIDWIFERY IN EDINBURGH UNIVERSITY.

WE understand that, pending the permanent filling of the chair of midwifery in the University of Edinburgh, the court has appointed Dr. Freeland Barbour to act as lecturer on midwifery to men students for the winter term (October to December). The court has also reappointed Dr. Ballantyne lecturer to women students for the next academical year on the same subject. The teaching of clinical obstetrics will be carried on by the staff of the Edinburgh Royal Maternity Hospital, and that of clinical gynaecology by Drs. Haig Ferguson and Fordyce in the Edinburgh Royal Infirmary.

THE HEALTH OF EDINBURGH IN 1920.

Dr. Maxwell Williamson's annual report of the Edinburgh Public Health Department for 1920 almost attains to the size of the last of the pre-war years (1913), and it is fully as interesting. It is still a report on Edinburgh with its older boundaries, for their extension to include Leith and other contiguous areas only began to be operative in November, 1920; the next report will deal with Greater Edinburgh, and it will also be founded on the revised statistics as to population made possible by the recent census. Meanwhile Dr. Williamson is in the happy position of being able to report the lowest general death rate for the city ever recorded—namely, 13.2 per 1,000 of the estimated population, a rate which is 3.3 lower than that of 1919, and 2.2 lower than the average of the five preceding years. He again demonstrates that the high death rates are found in those wards of the city where one and two-roomed houses abound. Large improvement schemes are needed, but the Corporation is hampered by the acute housing famine, which causes an initial difficulty in providing accommodation for occupiers whose houses are to be removed or improved.

Infantile Mortality and Maternity and Child Welfare.

The infantile mortality for 1920 was 89 per 1,000 live births, the lowest rate yet recorded. In 1897, when special attention began to be paid to the reduction of these deaths, the rate was 167 per 1,000; in 1906 it had fallen to 112; then the Notification of Births Act of 1907 made it possible for the health authorities to come more promptly into touch with the young infants born in the city, and in 1916 the rate fell to 100 per 1,000, in 1918 to 94 per 1,000, and in 1920 to 89 per 1,000. It is also interesting to look at the infantile mortality in decades; for the ten years 1890–1899 the rate was 143 per 1,000 live births; for the years 1900–1909 it was 122 per 1,000; for the years 1910–1919 it was 110 per 1,000, and for the single year 1920 it was only 89 per 1,000. Dr. T. Yule Finlay, who is in charge of the maternity and child welfare work, arrives at some interesting conclusions from an examination of the infantile mortality returns. He assumes that a large part of the improvement is due to the somewhat extensive child welfare work which has been going on during the past few years, but the fact that the city was wonderfully free from whooping-cough during the year must not be forgotten. The evidence available, however, shows that there has been little reduction in deaths from congenital conditions as compared with the previous year, and that the improvement has been mainly from post-natal conditions. This is quite intelligible, and such a result will probably continue until expectant mothers submit themselves for supervision at an early date in pregnancy, and until more is known about preserving ante-natal lives by care of the mother before delivery. Dr. Finlay's conclusion is of great importance. It is as follows:

"Much more research work along ante-natal lines still requires to be done before we can hope to deal effectively with deaths from congenital disease, and, while not neglecting to carry on the crusade against post-natal diseases, the time appears to have been reached when intensive work along ante-natal lines should be encouraged in order further to reduce the wastage of infant lives."

This is a true saying, and also a correct diagnosis of the present state of child welfare work. The congenital causes of infantile death, such as prematurity of birth (and specially the conditions leading to it), malformations, atrophy, atelectasis, injury at birth, and congenital syphilis, produce their dire effects chiefly in the first weeks of life. Consequently the neonatal death rate ought at once to show if mother welfare work, as represented by ante-natal clinics and the like, is beginning to save infantile lives. It is therefore with some interest that the neonatal death causes are scanned and compared. In 1919 there were 243 deaths in the first four weeks of life out of 5,612 live births, giving a neonatal death rate of 43 3; in 1920 there were 294 neonatal deaths out of 7,774 live births, producing a neonatal death rate of 37.8. In the former year the congenital conditions leading to death numbered 205 out of 243, whilst in the latter year they were 217 out of a total of 294; if the same proportion had been maintained the deaths due to congenital conditions ought to have been more nearly 249 than 217. This looks as if the work of the ante-natal clinics were beginning to have an effect, and the scrutiny of the individual causes would seem to point to a reduction in the fatality of premature birth as the means leading to this effect. This in no measure lessens the urgency of Dr. Finlay's call for concentration on the ante-natal causes; indeed, it reinforces it by pointing out that an improvement has already begun, and that therefore better things may be looked for along this line. A curious slip has, by the way, crept into the figures giving the number of patients attending the ante-natal clinics at the Royal Maternity Hospital: they are given as 2,257 new cases and 2,700 revisits, but the report of the hospital gives them as 802 new cases and 1,209 revisits. The matter of the stillbirths is not referred to; it is important that an attempt be made to give a stillbirths rate in future, for it is in this direction that ante-natal care ought soon to show whether or not it is achieving one of its main purposes. Dr. Finlay's analysis of the deaths among illegitimately born and legitimately born babies elicits some striking facts: during the first week of life illegitimacy does not seem greatly to increase the deaths, but for infants between 1 and 3 months it introduces an element of grave danger and a heightened mortality.

Venereal Diseases.

Dr. Lees gives an account of the working of the Corporation's venereal diseases scheme, which is carried on mainly at the Edinburgh Royal Infirmary; but the pregnant women suffering from these maladies are treated and delivered in an annexe of the Royal Maternity Hospital, and others of the women patients are received at the Bruntsfield Women's Hospital. It will be some time before the full value of this work can be estimated; difficulties of no small size must be overcome before it can be operated to the best purpose, but the results so far obtained are encouraging.

Cancer.

Many other matters are dealt with in this annual report. In some directions there is a hopeful outlook, as is seen in the diminished mortality from infectious diseases and phthisis; but in others there is no progress to be noted, and this remark applies especially to cancer, of which Dr. Williamson says "practically every year shows a definite increase in the number of fatalities." This sad fact is not, of course, peculiar to Edinburgh.

MENTAL DISEASE IN SCOTLAND.

According to the last annual report of the General Board of Control for Scotland there was an increase in 1920 of 226 registered insane persons in Scotland as compared with the previous year. The total number of insane persons of whom the Board had official cognizance was 17,806 on January 1st, 1921; this did not include insane persons maintained at home without being certified. Excluding transfers, the number of patients admitted to establishments was 3,783; of these 2,889 were admitted for the first time. In addition, 313 persons voluntarily entered establishments for the insane in Scotland for the treatment of mental disorders. During the same period 1,328 patients were discharged recovered, being

55 more than the recoveries in 1919. The death rate for private and rate aided patients in establishments was 10.1 per cent. of the average number resident, as compared with 12.1 per cent. in the previous year. This decline was mainly accounted for by the absence of epidemics, such as influenza. The Medical Commissioners reported favourably on the careful and capable management of the institutions, and on the satisfactory standard of efficiency maintained. The Board recommends an early revision of such terms in the Lunacy Acts as "lunacy," "lunatic," "asylum," and "pauper lunatic." Legislation is also recommended for the establishment and maintenance by local authorities of psychiatric clinics, open to all classes of the community, for the treatment of mental disease in its incipient forms.

Causes of Mental Breakdown.

The ninety-fourth annual report of James Murray's Royal Asylum, Perth, has also appeared recently, and contains some interesting observations on the causes of mental disease by the Physician Superintendent, Dr. D. Maxwell Ross. He remarks on the number of cases in which mental stress and worry are assigned by the relatives as the cause of the illness. In very many of these cases, however, it was found on close examination that the worry exhibited was groundless and unjustified. "It is now generally admitted," he continues, "that alcoholic excess, which some years ago was regarded as a prolific cause of insanity, is much more commonly a symptom. The same is undoubtedly in most cases true of such conditions as 'worry,' 'anxiety,' 'sleeplessness,' 'overwork.' The experiences of the war have shown that the moderately healthy man can withstand excessive and protracted mental and physical strain without permanent harm. Such conditions may undoubtedly, if genuine and prolonged, produce a state of exhaustion which may lead to a breakdown. But it should be realized that in the great majority of cases these conditions are indications that the danger-point has already been passed, and that a state of mental disease is already in being. Patients brought under treatment at this stage have an incomparably greater chance of a perfect recovery than those who delay till definite psychotic symptoms develop."

India.

AUXILIARY FORCE MEDICAL CORPS.

THE regulations for the Indian Auxiliary Force Medical Corps provide that any person eligible for enrolment under the Auxiliary Force Act of 1920 may apply for a commission in the medical corps if he holds certain recognized medical qualifications. The qualifications which are recognized are as follows: (*a*) A qualification registrable in the United Kingdom; (*b*) late medical service of Madras; (*c*) membership of the State medical faculty, Bengal; (*d*) membership of the College of Physicians and Surgeons, Bombay; (*e*) diplomas or degrees of American medical schools which are recognized by the conjoint examining board of the Royal College of Physicians of London and the Royal College of Surgeons of England. Officers in the medical corps will be posted to a unit of the auxiliary force or to a medical unit for service within a prescribed local area, but if not so posted will be placed under the orders of officers commanding station hospitals or will be supernumeraries of local units of the auxiliary force. During training they will be entitled to the ordinary pay and allowances of officers of the auxiliary force, but when called out or embodied they will receive pay and allowances in accordance with the corresponding ranks of the Royal Army Medical Corps serving in India. Promotion will be in accordance with the scale in force for the time being for regular officers R.A.M.C., and all previous commissioned service as a medical officer will count towards promotion. A medical officer holding a commission in the regular army may under certain limitations be attached at his own request to a unit of the auxiliary force, and when so attached will be entitled to the allowances which regimental officers receive when absent from their corps headquarters on duty. Non-commissioned officers and men of the Auxiliary Force Medical Corps will be required to undergo periods of training similar to the infantry, but purely military training will be restricted to a minimum, and they will be trained in first-aid and nursing (in hospital whenever possible), in sanitation, water purification, and the formation of first-aid posts, and similar field operations.

CEREBRO-SPINAL MENINGITIS.

Outbreaks of epidemic cerebro-spinal meningitis have occurred in Hong Kong and also in Goa, and the number of deaths from the disease in Bombay has been increasing; there were eight in January, thirteen in February, and thirty-one in March. Calling attention to these facts, the executive health officer for Bombay, Dr. J. E. Sandilands, points out that the infection is conveyed by the nasal and laryngeal secretions, and that personal precautions similar to those against influenza should be taken.

PROVINCIALIZATION OF HEALTH OFFICERS.

The *Pioneer* announces that in accordance with the recommendation of the local municipal conference the Madras Government has passed orders provincializing health officers and lending them to local bodies. Two classes of appointments have been sanctioned—for assistant surgeons and subassistant surgeons respectively. The first class is to receive a salary of 100 to 300 rupees a month, and the second class 50 to 150 rupees, according to service. The Government also proposes that deputy sanitary commissioners shall be recruited from these ranks

PUBLIC HEALTH OF BENGAL.

The Government of Bengal has constituted a new Sanitary Board, which will advise the Ministry of Local Self-Government in all matters relating to the public health of Bengal, including schemes for water supply, sewerage, and drainage, submitted by local bodies. The Board will recommend to Government the order in which projects of sanitary and antimalarial engineering should be taken up and the grants and loans to be made for such schemes. It will also advise on the promotion of researches and investigations into the prevalence of infectious, communicable, and preventable human diseases. It will report not only on matters referred to it, but make recommendations on any question of public health concerning the people of Bengal.

Correspondence.

THE GREAT MULTITUDE OF STUDENTS.

SIR,—In the interest of the honour and dignity of the medical profession I suggest that it is time to make the public understand that the numbers of students who are now coming forward threatens so to overcrowd the profession that it will be intensely difficult for many to make even a living.

In South Africa two medical university colleges have been instituted, the one at Cape Town and the other in Johannesburg. The total white inhabitants in all the Provinces and Rhodesia only amount to a little over one million, for which there are more than sufficient doctors already available, and the medical students now studying in South Africa, England, and Holland, are more numerous than the doctors already established there.

It requires no prophet to foresee that the future is fraught with grave danger inasmuch as while the few may do very well and a fair number make a reasonable income, a large number will be quite unable to make a living.—I am, etc.,

FIASCO.

THE COLON AND COLITIS.

SIR,—After repeated observations during operations and in the *post-mortem* room, I published an article[1] in which I stated that the colon has normally a considerable degree of mobility, especially the proximal part, and that this being the normal state of affairs, it is not justifiable to assume that a mobile colon in a dyspeptic patient is a case of cause and effect; and consequently colopexy, which

[1] *Lancet*, April 30th, 1921.

seems to be much in vogue just now, is not an operation which is destined to stand the test of time.

Lord Dawson, in an admirable paper published in the BRITISH MEDICAL JOURNAL of July 9th, 1921, though he does not mention the normal anatomical arrangement of the colon, is also of opinion that anatomical varieties have little or nothing to do with colonic dyspepsia and colitis, and therefore colopexy, except in certain cases, is unlikely to survive.

In the issue of July 23rd of the same journal, Mr. Sheen offers three comments upon Lord Dawson's paper which, in his opinion, justify the operation of colopexy and other fixation operations. He says, "anatomical varieties do count, and fixing operations are in use and of value." I am not sure that he appreciates the very wide variations in the mobility of the colon, which, according to my observations, appear to fall within normal limits. Undoubtedly fixation operations are in use, but their value is not very convincing. It is, perhaps, not fair to argue from one operation to another, though of a similar kind, but such operations as gastropexy and nephropexy were very popular at one time. I do not remember seeing gastropexy done once during the last eight years, and it has become generally recognized that a kidney which is sufficiently movable to deserve the distinction of being called mobile, only produces physical symptoms when the ureter becomes kinked across some such obstruction as an abnormal renal artery. Nephropexy may be a justifiable operation under such circumstances, and likewise in certain cases, which I specified in my article referred to above, I believe colopexy is a proper operation to perform.

Mr. Sheen's second comment, which relates to the usefulness of a properly fitting "truss" belt, and his third comment, which introduces the mesenteric drag as responsible for the pain and other dyspeptic symptoms, are really one. He brings forward the well known fact that, under the ordinary local anaesthesia, bowel manipulation causes no pain, but dragging on the mesentery does. It is his opinion that the drag of the prolapsed viscera on their mesenteries is responsible for colonic dyspepsia. I think there is a much more probable explanation for the pain and discomfort in these patients, and that is irregular intestinal motility and flatulence. Post-operative flatulence is common after even gentle handling of the hollow viscera, and occurs even when the patient is resting in bed with the head lower than the feet, where there can be no question of mesenteric drag. The pain and discomfort experienced at this time seems to me to be a better mimicry of dyspepsia than any caused by pulling on the mesentery, for the colon type of patient, though he does have definite pain sometimes, much more frequently has discomfort rather than pain, whereas pulling on a mesentery produces the most excruciating agony. Moreover, I think it requires proof that, with the abdominal wall intact, drag, in the strict sense of the term, can occur.

Keith's suggestion, to which Lord Dawson refers, that the neuro-musculature of the intestine is at fault in these cases, has not been made without definite evidence—evidence which is more convincing than any as yet brought forward in favour of the anatomical variation theory.

It must have happened to many surgeons, as it has to me, to operate on dyspeptic patients with identical symptoms in whom the ascending colon has been in some very loose and in others fixed. But the most striking instance of which I know occurred in two cases operated upon consecutively on the same afternoon by Sir Berkeley Moynihan. The symptoms were so alike that the notes of one might have been copied from the other, and yet in one the ascending colon could be brought right out on to the abdomen, and in the other the fixation was even more pronounced than the usual anatomical description—indeed, no fixation operation could have made a more complete and thorough colopexy.—I am, etc.,

Leeds, July 30th. E. R. FLINT.

THE OPERATIVE TREATMENT OF ANGINA PECTORIS.

SIR,—Jonnesco's account of his operation (*Bull. de l'Acad. de Méd.*, 84, 1920, p. 93), to which Sir Clifford Allbutt refers in your issue of July 23rd, contains some interesting features which call for comment, and, although I have already addressed you on the subject (BRITISH MEDICAL JOURNAL, 1920, ii, p. 840), perhaps you will permit me again to refer to some additional points.

It will be agreed by those who are cognizant of it that rarely has a more notable contribution been made to Science, properly so-called, than that which was the life-work of W. H. Gaskell—namely, the anatomy, and incidentally the physiology, of the "involuntary nervous system." With the caution of one writing with a fullness of knowledge, and after an amount of steady work on particular lines rarely equalled, he commences his summary by modestly stating that the conclusions he had come to were those he entertained at the time he wrote. That they might be modified by fresh facts he would have been the first to admit.

M. Jonnesco, however, "sans entrer dans de longs détails," and basing his remarks chiefly on the views of François Franck, rapidly sketches the whole mechanism, or what he assumes to be the whole mechanism, of angina pectoris, its nature, cause, and relief, and places it neat in a nutshell, thus solving at a stroke what is admittedly to many still an obscure problem in very many instances. He adds that while his success in the case he relates was complete, by unilateral ablation of the cervical sympathetic and first dorsal ganglia, "l'opération étant si simple et innocent," it is preferable to get rid of the sympathetic on both sides while you are at it—"dans le suite"—even if unilateral resection might be enough! Why Dame Nature had such an amount of superfluous time on her hands when placing the baubles "dans le cou" at all, beggars imagination! I stated in my last letter that double sympathotomy was not always so simple and innocent a procedure in other hands than those of M. Jonnesco, and that in those of that expert anatomist and finished surgeon the late Mr. C. B. Lockwood, it had been promptly followed by death, as it is likely to be again and in hands no less skilful. I confess, therefore, that the routine recommendation of double ablation would require serious consideration.

M. Jonnesco mentions an interesting fact in connexion with the avulsion of the first thoracic ganglion in the case in question—namely, that while the patient was under cervical stovainization, he complained of violent pain and electrical tinglings (vibrations électriques) in the fingers of the left hand, when the ganglion was torn away. Is it not conceivable that this may have been due to injury to sensory intercostal fibres, and in no way proof of the transmission of stimuli by way of the sympathetic connexion with the central nervous system? That the latter, however, is possible is also probable. Gaskell maintains that all ganglia in the heart itself are vagal (*The Involuntary Nervous System*, p. 79), but confesses to uncertainty as regards the innervation of the coronary and cerebral arteries. I have, however, found vascular ganglia in both these situations, and have before published the fact. If these were not on motor fibres issuing from the thoracic visceral outflow, they must naturally have been on inhibitory (vagal) fibres, certainly in the case of the coronary arteries. In sections of the larger nerves accompanying the coronary arteries, branches of which innervate the muscular coat of those vessels, ganglia are easily demonstrable and should, according to Gaskell, be vagal. In one instance in my experience, moreover, a coronary ganglion lay between the muscular coat and the intima and close to an intravascular aneurysm. In this case angina pectoris was a constant and ultimately fatal feature.

Great as Gaskell's work was, he would have been the first to confess its incompleteness, and that there are afferent fibres in all innervation, however modified, appears to me to be as probable as that all muscular tissue, wherever found, is innervated. That unilateral section or ablation of the sympathetic may be practised as safely as one pneumogastric may be divided, as it has been accidentally because of the innervation of both sides of the heart from one side through the plexuses, is unquestionable, and persistent angina pectoris with unilateral radiation may justify its performance; but one's conceptions of the involuntary nervous system will have to be revised if double ablation can be carried out with impunity. That conditions at the base of the aorta are active in the production of anginal symptoms in a certain number of cases is undeniable, and I would recall Sir Clifford Allbutt's classic description of the case and the findings in it, at one time under the care of his teacher Dr. Bence Jones; but no single cause of angina pectoris will cover all cases, although some causes are more

often operative than others. The diagnosis of the cause, often a very difficult matter, naturally determines the treatment of the condition in any given case.—I am, etc.,

London, W., July 23rd. ALEXANDER BLACKHALL-MORISON.

THE USUAL SITE OF ENDOLARYNGEAL CANCER.

SIR,—Surely Sir StClair Thomson, in his letter in your issue of July 23rd, has somewhat overstated the case when he asserts that direct examination after laryngo-fissure is the only reliable method of determining the precise site of carcinoma of the vocal cord, seeing that the condition is regularly diagnosed by indirect laryngoscopic examination before the question of thyro-fissure arises.

Whilst Sir StClair Thomson's contribution of 50 cases exceeds that of any other individual laryngologist in this country, and would of itself have almost sufficed to settle the question, there has been a growing admission for many years that Virchow's teaching as to the exact site of origin of laryngeal cancer needed readjusting, the evidence being rather of a cumulative kind than due to any sudden discovery. During later years better opportunities have arisen for earlier diagnosis.

As I have pointed out in my monograph on intrinsic cancer of the larynx, careful search amongst the hundreds of cases of cancer of the larynx recorded in the literature—as also of all the cases operated upon by thyro-fissure (including Sir StClair Thomson's cases up to this date, the whole of which had been already published in various medical journals)—furnished a proof that the favourite site of origin of endolaryngeal epithelioma was the anterior and middle third of the vocal cord.

My literary research also led me to surmise, as no doubt others have done, that the starting-point—at any rate in the majority of cases—was the junction of the anterior and middle thirds of the vocal cords, which is what one would expect, since it is the position of greatest exposure to extraneous irritation, and that extension beyond this position indicated a later stage of the disease.

But apart from the literature, my own observations of the fact have not been confined to those cases of thyro-fissure in which I have had the opportunity of co-operating with Sir StClair Thomson, but are based also on a number of other cases in which I have been associated with other of my colleagues.

My monograph, though only published in 1918, occupied three years' research into the literature, and the earlier portion, which dealt with the clinical aspect of endolaryngeal cancer, had been completed (with the exception of a few later references) a considerable time before the date referred to by Sir StClair Thomson. At the meeting of the Section of Laryngology, Royal Society of Medicine, in 1917, Sir StClair Thomson only broadly stated the results of his own observations, and I fail to understand how such a rough general statement can now be submitted as a definite conclusion, or as strictly coinciding with the views I had arrived at and published in 1918. However, he has now fully elaborated his observations, and so effectively as to crown the pile of evidence and close the matter under observation for good.—I am, etc.,

London, W., Aug. 5th. IRWIN MOORE.

CAPILLARY PRESSURE.

SIR,—Dr. Henderson (July 30th, p. 170) asks me to revise my "erroneous conception of what Professor Hill has really stated." Dr. Henderson's restatement of what Dr. Hill stated in his lecture does not in the least alter my conception of it.

Dr. Hill stated that he found the pressure of the brain against the skull to be a certain amount, and that he took this to be a measure of the pressure in the arterioles and capillaries of the brain. He had no right to take the one as a measure of the other. It was a wrong assumption, as it took no account of the tension in the walls of the arterioles and capillaries which aids the outside pressure in balancing the greater pressure inside these vessels.

There is such a tension in the walls of the blood vessels in spite of Dr. McQueen's assertions to the contrary. When a liquid is forced through a tube with non-rigid walls there is necessarily greater pressure at any point inside the tube than at the immediately opposite point outside. This is necessary in order to maintain the patency of the tube. The same thing is stated by Dr. Hill in another way when he says that "an artery, big or small, when compressed by a surrounding fluid pressure is shut up by a compressive force practically equal to that of the pressure which is maintaining the flow through the artery, and which is measured directly by a manometer connected with the lumen of the artery." The reason why a pressure slightly greater than that inside them has to be applied to the outside of arteries to stop the flow in them is that their walls have a slight amount of rigidity. But the rigidity of capillary walls is negligible, so that as long as there is any flow of blood through them we may be sure that the inside pressure is greater than the outside. The difference between the two necessitates tension in the wall.

Dr. Hill also stated that he found the pressure in the torcular Herophili to be equal to the pressure of the cerebro-spinal fluid and to that of the brain against the skull. I do not dispute the correctness of these observations. But Dr. Hill goes on to say: "I concluded that the cerebral capillary pressure is practically the same as the pressure in the cerebral veins; only the least difference is required to maintain the flow." What he here calls a conclusion is an unwarranted assumption. To force through the capillaries a viscous liquid like blood containing semi-solid corpuscles of diameter only a little less than that of the capillaries must require a considerable difference of pressure between arterioles and venules. Anyone can get a rough idea of this by observing the ease with which the contents of the barrel of a hypodermic syringe can be expelled when the needle has been broken off short, compared with the force required to expel the contents at the same rate with a whole needle on. And one should bear in mind that the calibre of a capillary is only about one-twentieth part of that of a fine hypodermic needle.

The pressure in a capillary at the end next the arteriole approximates to that of the arteriole—that at the end next the venule to that of the venule. What the actual difference is between arteriole pressure and venule pressure Dr. Hill's experiments do not show. His assumptions lead to the conclusion that there is practically no difference, for he takes the pressure of the brain against the skull as a measure of the pressure in the arterioles, and finds that the former is equal to the pressure in the torcular Herophili, which is less than the pressure in the venules. These experimental observations *plus* the assumptions are what Dr. McQueen calls "experimental evidence."

Dr. Henderson's observation on the behaviour of the retinal veins when a slight pressure is made with the finger on the outside of the eyeball is interesting evidence of the correctness of the explanation given by me of the slowing of the current in the capillaries in Dr. Hill's experiment with the Roy and Brown apparatus. I stated that the slowing of the current was due to a narrowing of the calibre of the capillaries. In the case of the retinal veins under similar conditions this narrowing can be seen. It is evident that before the contraction the veins must have been distended—that is, their walls were on the stretch, which implies the existence of tension in them. This in turn implies greater pressure in the veins than outside them.

I hope Dr. Henderson may follow my argument. I have but little hope that Dr. McQueen or Dr. Hill will do so, as the former wrote and the latter approved of the following sentence (July 30th, paragraph 4): "These low figures are the sum not merely of the lateral pressure but also of the kinetic energy of flow." Pressure and energy (kinetic or otherwise), being quantities of different dimensions, cannot be added to form a sum. One might as well talk of the sum of the height of a monument and the area of its base. Dr. McQueen's method of dealing with the equation,

$$p_1 - p_2 = \frac{T}{R}$$

also betrays an unscientific mind. He began by defining the different letters in the same way as I had done, but did not adhere to the same as he went along. Hence the absurd result at which he arrived.—I am, etc.,

Knock, Belfast, August 1st. JOHN R. GILLESPIE.

CHRONIC NASOPHARYNGEAL INFECTION IN CHILDREN.

SIR,—I have not been in a position to answer Dr. McBride's letter (which appeared in your issue of July 16th) before because I have been away on holiday.

The main point which arises from his letter is whether a chronic nasopharyngeal trouble of sufficient degree to cause toxaemia from septic absorption can exist without the presence of adenoids or tonsils which need operation; I maintain that this does happen, especially in older children. My cases were practically all over the age of 6 years.

I wish to make it clear, however, that the cases on which my observations were based included many which needed operation and had definite tonsils and adenoids. The main object of my paper was to point out the results of chronic nasopharyngeal toxaemia, and not to raise the question of whether operation was needed or not. I regret that I made it appear that I regarded obstruction as the one criterion for operation. That is not the case, and I quite agree with Dr. McBride that adenoids and tonsils may, even though they are not giving rise to definite obstruction, cause toxaemia, and need removal.

My contention that nasopharyngeal toxaemia can arise from conditions which do not necessarily require operation is based upon observations of (1) cases which have been examined digitally and by inspection of the tonsils, and have been found to be free from operable trouble and have yet had the symptoms of frequently recurring colds with catarrh, together with the other general signs of toxaemia which I mentioned in my paper; these signs and symptoms have cleared up completely in those children who could be removed from the climatic conditions and from the opportunities for infection obtaining in certain centres, and have recurred when the children have returned to these conditions. (2) Cases which have been operated on by competent surgeons and have improved temporarily, but have suffered from a recurrence, and have not been cured until they have been put under better climatic conditions. In younger children, where there is a greater chance of stagnation, hypertrophy and the formation of adenoids is very common; but I am convinced from observations of my own cases that, especially in older children, a chronic infection of the nasopharynx occurs which remains inflammatory, and does not go on to hypertrophy and the formation of adenoids. I think that many physicians—at any rate those physicians who deal with children, either in hospital out-patient departments or elsewhere in the large industrial centres—will agree with me in this contention.

To turn to Dr. McBride's further questions, it is practically impossible to avoid contamination in taking a swab in the nasopharynx, especially in children, and Dr. Sellers and myself were careful therefore to draw no positive conclusions from the results, but only to set forth what was found. The cases he examined included many needing operation, the investigation not being undertaken with the idea of showing whether operation was needed or not. My cases were not all examined by a rhinologist, though many were examined and treated by operation. However, since many of those which I judged not to need operation have improved with suitable treatment, especially removal from bad climatic and hygienic conditions, I cannot agree that all cases of chronic nasopharyngeal infection in children need operation.

With regard to the connexion between the nasopharyngeal trouble and the symptoms of toxaemia, the fact that the symptoms which I have enumerated as indicating toxaemia improved definitely in conjunction with the improvement of the nasal symptoms and recurred with a recrudescence of the latter, satisfied me of the relation between the two, especially after, as I emphasize in the paper, I had employed a process of careful differential diagnosis to exclude other toxaemias, notably that of early tuberculous infection.—I am, etc.,

Manchester, Aug. 8th. C. PAGET LAPAGE.

DEATHS FROM PLUMBISM.

SIR,—Your correspondent "Statisticus" (July 30th, p. 172) raises an interesting question, the answer to which is found in the annual report of the Chief Inspector of Factories and Workshops for the year 1919, p. 61. A considerable proportion of the reported cases of plumbism comes from the pottery industry. Broadly speaking, there are now no new cases of plumbism among potters, and the cases reported in that industry are mainly old cases where the disease was contracted many years ago. When deaths occur from chronic nephritis and so forth following lead poisoning they are returned as deaths from lead poisoning, and the rate of mortality is, of course, very high. The Home Office has really been much more successful in the pottery industry than is apparent from the statistics.—I am, etc.,

London, N.W., Aug. 5th. STEPHEN MIALL.

MEDICAL IMPRESSIONS OF THE MINERS' STRIKE.

SIR,—There is another aspect of the recent strike that deserves consideration, and that is the effects upon the miners' wives and children. There is no doubt that owing to the nature of the meals—in this district soup was the staple diet, with roughly 3 ounces of bread per capita per diem—a deficiency of vitamins was frequently present in their diet. The soup was as a rule boiled for three hours, a vitamin-destroying process, and, in many instances, unless furnished with a medical certificate, the children, who for the most part were fed at school, received little or no milk.

During the three months' strike I had occasion to attend two cases of scorbutus the direct result of inefficient feeding. The first case was that of a mentally deficient child, aged 6, whose father was a member of a soup-kitchen committee. The child had received practically no milk, but was fed almost entirely on soup, and was given an additional supply of this concoction owing to the father's official position. The child, who on the previous day was attending school, was covered with a discrete, purpuric eruption, the distribution being trunk and limbs. There was in addition ecchymosis of the arms and legs, and profuse haemorrhage from the gums and nasopharynx. Antiscorbutic remedies were ordered, consisting of metagen—which is said to contain all the vitamins, fat-soluble A, water-soluble B, and water-soluble C (antiscorbutic)—and orange juice, together with adrenaline for haemorrhage, but the child died of syncope within twenty-four hours and before metagen could be obtained.

A month later the second case occurred—a girl aged 5—in whom the signs were exactly analogous, with, in addition, slight haemorrhage from the vulva and melaena. One could not place a sixpence between the purpuric spots on the greater part of trunk and limbs, the face and neck, as in the first case, being spared. The child's dietary was as follows: Breakfast (at school), cocoa to which condensed milk was added, bread and margarine; dinner (at home), soup from soup kitchen containing overcooked vegetables, with now and then a slice of bread added; tea (also at home), bread, tea with condensed milk. An immediate improvement was observed following prompt administration of metagen and orange juice, with milk and liberal supply of fresh vegetables. The haemorrhage ceased and the purpuric eruption almost disappeared in six days, marked improvement being noticed within forty-eight hours.

The age of the children is worth noting, for they are then more vulnerable because of the lack of stored-up vitamins as compared with the adult. I have observed no evidence of deficiency disease amongst the women, but many lost weight—an advantage with the obese—although signs of semi-starvation were evident in one case, phthisis in another. As regards the men, as they themselves acknowledge, they never felt better in their lives.—I am, etc.,

J. BOYD PRIMMER.

Cowdenbeath, Fife, Scotland, July 30th.

SIR,—A letter upon this subject in your issue of July 16th is effectively answered and disposed of by a communication from a practitioner in a Durham mining district, and appearing in the JOURNAL for July 30th. But, having practised for many years in the mining district of South Staffordshire, I offer my testimony for what it may be worth, and such testimony entirely confirms that of the writer from Durham, and so, of course, represents an opinion differing essentially from that contained in the original letter.

During the great war I was called upon to examine a large number of recruits at a local recruiting centre, and if one fact emerged more clearly than any other, it was that the physique of the miners far excelled that of any other class. This was quite unmistakable, and was frequently commented upon and discussed by the medical men who conducted the examinations. Apart from the miners, men from all sorts of occupation were dealt with —iron-workers, farm hands, chauffeurs, gardeners, shop assistants, brewery hands, etc.—and I venture to say that, given an equal number following each vocation, an experienced man would have little difficulty in picking out the miners, with few errors, owing to the excellence of their physique. Next to them came the iron-workers. Clearly the amount of holiday required by the manual worker must remain a matter of opinion, and the idea of two weeks' holiday for the miner, with full remuneration, after each three months of work sounds highly delightful. What the average miner would do during his long absence from work it is difficult to conjecture. This much, however, I say without hesitation: If the miner, as I saw him at the recruiting centre, is in need of the suggested holiday, the other men who came up for examination, judging from their condition, required at least four weeks' holiday after each three months' work.

What of the medical practitioner himself? His expectation of life is lower than that of members of the other professions. Might not the discrepancy be removed, if the suggested extension of holidays, with accompanying remuneration, were made operative in his case also?

No, Sir, a great deal too much flabby twaddle respecting overwork is propagated and swallowed to-day. Ergophobia is rampant, and it is high time for recognition of the fact that good health and contentment can be best assured by the steady pursuit of one's vocation, whatever it may be. This still leaves leisure for a hobby—and a hobby is very desirable for every one.

Of course, any such extension of holiday as was proposed by the original writer, with its lessened output, would be fatal to our national existence, unless other nations in competition with ourselves adopted the same plan. Into this aspect of the question I do not propose to enter.—I am, etc.,

Wednesbury, Staffs, Aug. 1st. WALTER GARMAN.

STREPTOCOCCAL VACCINES IN ASTHMA.

SIR,—I was very interested in the original article in your issue of July 16th (p. 71) by Sir Leonard Rogers on streptococcal vaccines in asthma. My experience may be interesting as proving that the treatment is certainly reliable in certain types.

In 1916 in the Murree Hills, India, an elderly lady, an officer's wife, consulted me for this condition with a view to undergo vaccine treatment. I accordingly prepared an autogenous vaccine from her nose, and later from her sputum. The organism was a streptococcus of medium length, but I now forget its chemical and biological characteristics. The patient received about twelve inoculations in all in weekly doses varying from 150 to 500 millions. She showed a rapid improvement while she remained in the hills. I heard from her husband a year later that she was still free from paroxysms and also from chronic bronchitis.—I am, etc.,

J. E. H. GATT, Major R.A.M.C.

Curragh Camp, co. Kildare, July 31st.

BIRTH CONTROL.

SIR,—Nature's method of limiting population is to reproduce freely and let the majority (the unfit) be eliminated by failure, so that only a minority (the fittest) survive. Man strives to defeat Nature, keeping the unfit alive by soft living, sanitation, and medical treatment. The result of man's efforts is not merely an increase of numbers, but the addition of many unfit members to the population and a diminution of the average health. Birth control, in the ordinary sense of the term, does not improve matters; it only diminishes numbers, and by lessening the struggle for existence it gives still greater opportunity for survival of the unfit. From the eugenic point of view the limitation of births (in the ordinary sense) is attended with the danger of degeneration of the human race.

It is true that the human race, increasing at the present rate, will soon exceed the capacity of the world to support it, and man will have to fight his neighbour for the mere means of subsistence; but to avert this by means of contraceptors is to substitute one catastrophe for another.

Soft living, sanitation, and medical treatment, by increasing the number of surviving children, increase the burden of family life, and thus prevent early marriage. This is bad for the future race, as the children of young parents have, by inheritance and by parental care, the best chance of healthy life; moreover, late marriage is one of the causes of prostitution and of venereal disease.

In short, medical science is the chief cause of overpopulation and the diminution of average human fitness; it is also a cause of late marriage with its attendant evils. It would make my letter too long to discuss the possible remedies, eugenics, for instance; but it behoves the medical profession, who have created the difficulty, to find the true remedy. I cannot see it in contraception.—I am, etc.,

Cambridge, August 1st. F. J. ALLEN.

SIR,—The cult of cheapness is one of the worst causes and results of our free trade policy which teaches people to think they need not make sacrifices to secure future benefit. And precisely similarly do the people behave who avoid marriage or limit their families on the ground of expense. They dread present discomfort and forfeit future gain and security. The present difficulties of the middle classes are largely due to their want of families; they have so few sons to "speak with the enemy in the gate." Doctors, often marrying late, are similarly handicapped. Three of us, fellow students and become senior officers in the three services, met once in London with our wives, and not a child between us. A well known fellow student of mine lamented to me in Edinburgh recently the number of our coevals in the profession who were childless. Consequently, said he, we shall be replaced by people less well educated, people who have not had the up-bringing we should have given our sons to fit them for the profession.

The strength of a nation is in its families. If any important section has but few children to take its place, its ideals will not be carried forward, but will be lost. Children, besides, do prevent divorces; perhaps, however, we should go further back about that.

But should people bring up children at great cost and only to be miserable? One of my acquaintance refuses to have a second child because he could not then play golf. Is there, then, no pleasure in children which shall compensate for the troubles and expenses they bring upon you? I notice that the penurious Roman Catholic French-Canadian farmers are spreading out of Quebec and occupying more and more of Ontario. I fancy those hard-living parents would think their struggles to bring up their large (ten to twenty) families worth while when they see how their group is strengthening its position. If a race comes to find no instinctive pleasure in children it will probably be swept away by others more virile. One man will live where another will starve; prudence and selfishness are not identical.

In her book, *The Strength of a People*, Mrs. Bosanquet, who signed the Majority Report of the Poor Law Commission, tells the story of two girls in domestic service who became engaged. One was imprudent, married at once, lived in lodgings, trusted to the church and the parish doctor to see her through her first confinement, had no foresight or management, every succeeding child only added to her worries, and her marriage was a failure. The other was prudent, did not marry till, after six months, she and her fiancé had chosen a house and its furniture. Then she married, and their house was their own careful choice; every table and chair reminded them of the afternoon they had had together when it was chosen; they were amusement enough to themselves, and they saved their money for the expenses of her confinement. He had not to seek amusement outside his home, did his work with a high sanction and got promoted, and each child was only an added pleasure. Idyllic; yes, but sometimes true. One of the happiest men I have known was a Marine sergeant with ten children, and a bed in his house for stray boys he thought he should help.

One of my friends married young and had five children;

this required management. He certainly could not go trips, take courses and extra qualifications, but he did his work all right, and his sons were there to help in the war, and one of them has won a position of Imperial usefulness far above that of his father or me. Is that no compensation to his parents for old-time difficulties they have by now almost forgotten? A bad tree cannot bring forth good fruit.—I am, etc.,

Naval and Military Club, July 29th. W. E. HOME.

SIR,—An advocate of "birth control" (July 30th, p. 168) says that "continence is not and never will be" the principal means to that end. I can well believe that, for continence is the only legitimate means, and "birth control," as generally practised, is both illegitimate and immoral.

From a medical point of view, to control births can only be justified on the following grounds: (1) Because there is danger to the mother from childbirth. (2) Because, on account of the mental or physical condition of one or both parents, there is every reason to believe that the children would not be mentally or physically sound. For either of these two reasons, failing continence, I would be prepared to advise the parents how to control birth, and for no other reason.

In the case of both males and females it has been abundantly demonstrated that the soundness of their health is impaired by undue sexual indulgence, and, on the other hand, that vitality and virility are not only conserved but strengthened by the practice of "continence" as a habit. Honest guardians of the public health will therefore practise and preach the habit. Dr. Halliday Sutherland quotes Mr. Bernard Shaw and "a friend in the Church of Scotland." I go further than either of them, and state that a man who uses his wife for sexual intercourse other than for the purpose of propagation of his species is prostituting his own body and that of his wife to uses for which they were never intended, and is immoral to that extent.

The higher the ideal the fewer people that are able or willing to subscribe to it.—I am, etc.,

Barrowford, July 30th. ALFRED E. SELLER.

SIR,—Dr. Halliday Sutherland says in his letter that Malthus "was so concerned about the birth rate that he forgot that every one of us must die." As any one who has read the *Essay on the Principle of Population* knows, Malthus forgot nothing, and was concerned about the birth rate because of his belief that, in consequence of the relatively slow rate at which the food supply of countries is increased, a high birth rate necessarily causes a high death rate. Dr. Sutherland holds that "a high birth rate is not of necessity associated with a high death rate." The fact remains, however, that no country has ever had an annual birth rate of over 30 per 1,000 without having a low average duration of life. Dr. Sutherland has evaded my statement that the world's food supply has always been increased so slowly that only a small percentage of couples in the world could get sufficient food for more than two or three children. To certain other opponents I should like to say that emigration increases poverty in the mother country, because the majority of emigrants are adults; and also, that emigration is not migration, for colonials do not share our poor rates, taxes, and charities. —I am, etc.,

London, S.W., July 30th. BINNIE DUNLOP.

SIR,—Dr. Mary Scharlieb refers in her letter in your issue of July 16th to

> "some people who advocate the use of artificial preventives of conception go so far as to consider this knowledge an unmixed benefit to unmarried girls and women; indeed, one well known non-medical advocate of artificial prevention stated a few days ago that a young unmarried woman attending her clinic had already procured abortion twice, but she was thankful to have been able to teach her how to avoid that necessity in future!"

As my husband and I founded, and I control, the *only* birth control clinic in Britain, the above obviously will be widely recognized as referring to me. I must therefore crave your space to correct its misstatements.

Those of my words which Mrs. Scharlieb here travesties and misapplies in such a way as to make me appear to condone immorality, which my work is entirely calculated to do away with, have, fortunately, been published by Putnams in a shilling pamphlet giving the verbatim report of the "speeches and impressions of the Queen's Hall meeting on Constructive birth control." My exact words were (p. 24):

> "The second person who came to my clinic when it was first opened came on behalf of a girl of 20 who was pregnant for the sixth time! And every previous time she had had an abortion performed by her own mother! We, of course, had no help for that girl. We cannot deal with such cases. Yet it shows that in that terrible underworld of misery and anguish which we selfish, self-centred, lazy people so seldom visualize and understand, there *is* already 'knowledge' of a kind . . . which is utterly detrimental, utterly unwholesome, and tragic in its effects. The true knowledge which we are bringing to counteract that is clean and wholesome, and is pure physiological information to replace the miserable half knowledge which already exists."

Comparison of what I did say with what Dr. Scharlieb implies I said shows how she distorts my words, and I must ask her to withdraw her implications.

I should add that the method of control we advise in the clinic *cannot* be used by virgin girls, and therefore cannot have induced a single case of downfall. Moreover, almost without exception, those who apply to the clinic are married women who have already injured their health through too frequent childbirth.

Other points in this letter should be answered, but I will only deal with one more. Mrs. Scharlieb says her experience of over forty years convinces her that birth control "causes damage to a woman's nervous system"; yet she does not indicate which methods were used. When discussing this theme on the Birth Rate Commission I elicited from Mrs. Scharlieb that very many of her patients used (or rather got their husbands to use) the sheath and coitus interruptus. Dr. Scharlieb has only to read my book, *Wise Parenthood*, to learn the cause of the injuries which I clearly demonstrated are originated by these methods. But different processes have different physiological results, and it is really time that medical practitioners took the trouble at least to differentiate between totally distinct methods and to be explicit about which they refer to when they attempt to discuss a theme of such importance to the nation as the control of the quality of its conceptions.—I am, etc.,

Leatherhead, July 21st. MARIE CARMICHAEL STOPES.

We have referred this letter to Mrs. Scharlieb, who writes:

SIR,—I am sorry that my letter to the BRITISH MEDICAL JOURNAL of July 16th has given offence to Mrs. Marie Stopes, and that she feels that I make her to appear as condoning immorality. I am sure that this is far from being her intention.

I quoted the incident to which Dr. Stopes alludes on the authority of a doctor who was in the audience at the Queen's Hall when the lecture was given. I, of course, see that the statement made by Dr. Stopes was misunderstood by the hearer, and withdraw my statement and apologize for having given it currency.—I am, etc.,

Church Stretton, Aug. 8th. MARY SCHARLIEB.

CLINICAL AND LABORATORY METHODS.

SIR,—Having followed the correspondence concerning the line of research at St. Andrews with regard to early symptoms and prognosis, I beg to be allowed to state the matter as it appears to the young practitioner, possessing a certain amount of superficial knowledge, but very little based on personal experience. I would compare the minute investigation of symptoms to the attitude of a man approaching an isolated house. He sees a flickering light within it, a little smoke coming from an open window, and a little from the chimney. The problem before him is whether the room is on fire, or whether the fire burns normally in the grate but the smoke does not all go up the chimney. Immediate knowledge of his problem is essential to save the house. Should he contrast the varieties of smoke and flickerings he may, after some time, arrive at the correct answer, but by looking through the window he will come at once to the knowledge he requires. Similarly in disease, by looking at the diseased spot, or by testing for abnormal constituents of the body, a diagnosis is made, and treatment started at once. And on early treatment depends

20, 40, or perhaps 60 per cent. of the prognosis. An hour-glass stomach, constriction of the pylorus or colon, are seen by *x* rays, the *Spirochaeta pallida* is demonstrated in a sore, the bacillus of diphtheria isolated from the throat, the typical blood picture seen in pernicious anaemia—in all these diagnosis is settled at once.

Thus, Sir, it appears to me, starting on the practice of medicine, that my time would be more profitably spent endeavouring to get to the root of problems at once than to search after the meaning of symptoms, a process from which I cannot gain any definite knowledge under twenty years. Already I can recognize pyloric obstruction by means of *x* rays, but to diagnose it from symptoms with certainty would take me a lifetime, and I should be unable to pass on to others the results of my personal experience. If my views are worthless, or my reasoning at fault, correction will be welcome to one honestly inquiring after wisdom.—I am, etc.,

July 27th. M.B.LOND.

THE ORGANIZATION OF SCHOOL OPHTHALMIC WORK.

SIR,—In your issue of June 18th Dr. Wright Thomson joins issue with Mr. Bishop Harman on the subject of examining children of 7 years of age. I go further than Mr. Thomson, I examine the whole school by retinoscopy and pick out the defective ones for later examination, and obtain thereby more reliable results than are obtained by subjective tests in the hands of lay helpers.

My method is to address the school and explain what I am going to do and what they have got to do. I have a large class-room darkened and the children file in, keeping touch, so that they can all see what is being done, and so be prepared and thereby avoid the shyness that wastes time. A helper places them on the chair by the lamp and another one pulls them off it (which is another saving of time), and any defectives stand away for registration by a third helper for later examination. In a well regulated school orphanage with children from 15 to 4 years of age I have often done up to 200 per hour. Another day I pass them all in the same way for lid examination for trachoma, which is common out here, and it is quite easy to do more than that number per hour. My average of defectives over some years is 9.1 per cent., which compares favourably with other statistics.—I am, etc.,

Johannesburg, July 19th. A. GREENE BRINTON.

THE FORMOL-GEL REACTION IN SYPHILIS.

SIR,—I was very interested in Major Mackenzie's memorandum of his experience of this reaction in twenty-three cases, published in the BRITISH MEDICAL JOURNAL of June 11th. I was hopeful that at last a method had been found which would enable the clinician to diagnose syphilis without invoking the aid of the laboratory worker.

I therefore proceeded to test twenty-five serums, following faithfully the technique recommended by Major Mackenzie. I was disappointed to find that the serums all remained perfectly liquid, even after standing for several days, in spite of the fact that, as tested by the Wassermann reaction, fourteen of them were strongly positive.

One can therefore only come to the conclusion that this reaction is another "will o' the wisp," and of no value in the diagnosis of syphilis.—I am, etc.,

A. MURRAY STUART.
Surgeon in Charge of Venereal Diseases,
August 7th. Walsall General Hospital.

Obituary.

EDGAR FREEMAN MORRIS, M.R.C.S., L.S.A., Hereford.

THE announcement of the death on July 31st of Mr. Edgar Freeman Morris of Hereford was received by his colleagues throughout the county with profound regret. He was born in Hereford in 1857 and educated at the cathedral school. For about a year he was a pupil at the county hospital, and later became a student at University College Hospital. He took the diplomas of M.R.C.S. and L.S.A. in 1880, and after a year or so as an assistant in Eastbourne joined his father in practice in Hereford. There he soon became known as a careful and skilful surgeon, and in 1892 he was elected on the surgical staff of the county hospital; at the time of his resignation in 1917 he was the senior surgeon; he was then elected honorary consulting surgeon. He was very much interested in electrical therapeutics, and early in the present century installed in his consulting-rooms most complete electrical apparatus. A little later he was instrumental in securing a similar installation at the county hospital.

In his early manhood he was associated with the Volunteers and held the rank of captain. During the war he was consulting surgeon to several V.A.D. hospitals and was chairman of the local medical war committee. He was an active member locally of the British Medical Association, and succeeded his father as honorary secretary of the Herefordshire Medical Society, which was founded in 1859. Of late years he took a great interest in Freemasonry, and was a P.M. of the Vaga Lodge, of which he was the first initiate. He was a J.P. for the city of Hereford, and for many years vicar's warden of St. Peter's Church. He was twice married, and leaves a widow, a son, and two daughters to mourn their loss.

WE regret to record the death of Dr. RICHARD GRAMMER ALLEN, of Belper, on July 23rd. He was the son of the late Richard Rowland Allen, who for many years practised in Belper, and was educated at Belper School, Trent College, and Queen's College, Birmingham. He became a Member of the Royal College of Surgeons of England in 1875, and a Licentiate of the Royal College of Physicians of Edinburgh in 1876. Before commencing practice in Belper he was house-physician at the Queen's Hospital, Birmingham, and assistant house-surgeon at the Carlisle Infirmary. He was medical officer of health, Belper Urban District Council; medical officer, Belper Union Workhouse and Nos. 1 and 2 Districts of the Union; medical superintendent, Belper Joint Isolation Hospital. Dr. Allen was a member of the British Medical Association, and was for many years chairman of the Belper Conservative Club. He leaves a widow, a son (Dr. Richard Clayton Allen, who was in practice with his father), and two daughters.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on August 4th the degree of Bachelor of Medicine was conferred on H. L. Rayner (Balliol).

UNIVERSITY OF LONDON.

A MEETING of the Senate was held on July 20th.

The following were recognized teachers at the institutions and in the subjects indicated:

St. Bartholomew's Hospital Medical School.—Dr. Geoffrey Evans and Dr. C. M. Hinds Howell (Medicine), Mr. R. M. Vick (Surgery).

Guy's Hospital Medical School.—Dr. Geoffrey Marshall (Medicine), Mr. Ernest G. Slesinger (Surgery).

King's College Hospital Medical School.—Mr. Henry A. Burridge (Forensic Medicine), Mr. John Everidge and Dr. C. Jennings Marshall (Surgery), Dr. Arthur C. D. Firth and Dr. F. W. Tunnicliffe (Medicine), Mr. Cecil H. M. Hughes (Anaesthetics), Dr. Helen Ingleby (Pathology—Morbid Anatomy), Mr. J. W. Thomson Walker (Surgery—Urology), Dr. S. A. Kinnier Wilson (Neurology), Mr. Harold A. T. Fairbank (Surgery—Orthopaedics), Dr. Charles W. M. Hope (Laryngology).

Royal Army Medical College.—Brevet Lieut.-Colonel Henry M. J. Perry (Pathology), Lieut.-Colonel James Crawford Kennedy (Tropical Medicine), Brevet Colonel Percy S. Lelean (Hygiene), Lieut.-Colonel John Weir West (Surgery—Military).

The following were appointed to act as examiners for the second examination for medical degrees Part II in the session 1921–22, the chairmen of the respective boards being indicated by an asterisk:

Anatomy.—*Professor W. Wright and Professor E. Barclay-Smith, together with the external examiners, Professor G. Elliot-Smith and Dr. W. L. H. Duckworth.

Physiology.—Professor F. A. Bainbridge and Professor H. E. Roaf, together with the external examiners, Professor J. S. Macdonald and *Professor M. S. Pembrey.

Pharmacology.—Dr. P. Hamill and Dr. V. J. Woolley, together with the external examiners, *Professor F. Ransom and Professor J. A. Gunn.

The regulations for the second examination for medical degrees, Part II, and M.B., B.S. examination for external students were amended as follows:

Paragraph 4 (iii) on p. 230 of the Red Book, 1920–21, by the addition of the following words after "at a school of the University":

"Provided that, in and after October, 1923, no candidate shall be permitted to enter for the third examination for medical degrees under this regulation unless he has spent at least three years in the

required course of study, part or the whole of which may, however, have been followed prior to passing in anatomy and physiology at the second examination for medical degrees, Part II."

Paragraph 4 (ii) on p. 211 of the Blue Book, September, 1920, by the insertion of the words:

"Provided that, in and after October, 1923, the required course of study for the third examination must be shown to have covered at least three years."

Mr. H. J. Waring has been elected Chairman of the Brown Animal Sanatory Institution Committee.

Applications for the University chair of chemistry, tenable at Middlesex Hospital Medical School (salary £800 per annum), must be received by the Academic Registrar, University of London, by at latest the first post on September 22nd.

ST. THOMAS'S HOSPITAL.

An Entrance Arts Scholarship, 1921, value £25, has been awarded to R. A. Hill; and an Entrance Science Scholarship, 1921, value £150, to J. M. Ashton.

The Services.

ARMY DENTAL CORPS.

THE War Office announces that the rates of half-pay for officers of the Army Dental Corps, which were fixed in January last at half the rates of full pay, have been amended, and will now be the rates provided for other arms of the service in terms of Army Order 324 of 1919.

DEATHS IN THE SERVICES.

Colonel Andrew Francis Dobson, Madras Medical Service (retired), died in London on June 24th. He was born on June 10th, 1848, the son of Dr. Park Dobson of Longford, and educated at Trinity College, Dublin, where he gained a medical exhibition in 1869; he graduated B.A. and M.B. in 1871, also taking the L.R.C.S.I. in the same year. Entering the I.M.S. as assistant surgeon on March 30th, 1872, he attained the rank of colonel on May 4th, 1901, retiring on May 28th, 1906.

Colonel Samuel Henry O'Brien Banks, Bombay Medical Service (retired), died at Brighton on June 15th, aged 79. He was educated at the Carmichael School, Dublin, and took the L.R.C.S.I. in 1865 and L.K.Q.C.P. in 1866; and subsequently the F.R.C.S.I. and M.K.Q.C.P. in 1880. Entering the I.M.S. as assistant surgeon on October 1st, 1856, he attained the rank of brigade surgeon on November 19th, 1889, and that of surgeon-colonel on September 18th, 1895, and retired on November 13th, 1900. He served in the Abyssinian war of 1868, was present at the storming of Magdala, and received the medal. In November, 1888, he was appointed a Presidency surgeon in Bombay, and on promotion in 1895 was posted as P.M.O. of the Nagpur district, Central Provinces.

Colonel Charles Henry Hale, D.S.O., C.M.G., Army Medical Staff (retired), died at Plymouth on July 20th, aged 58. He was born at Eastbourne, and was the younger brother of Lieut.-Colonel G. E. Hale, R.A.M.C. He was educated at St. Mary's Hospital, taking the M.R.C.S. and L.R.C.P.Lond. in 1884. After acting as assistant medical officer at the Salop and Montgomery Counties Asylum, he entered the army as surgeon on February 5th, 1887, becoming lieutenant-colonel on June 7th, 1911, and full colonel on March 1st, 1915. He served in South Africa in the Matabele campaign of 1896, when he was mentioned in dispatches and received the D.S.O.; in the South African war in 1901–2 in operations in Cape Colony and in the Orange River Colony, receiving the Queen's medal with four clasps; and in the recent war from 1914 to 1918, as A.D.M.S. of the 13th Division in Gallipoli, and as a D.D.M.S. in the Egyptian Expeditionary Force; was mentioned in dispatches in the *London Gazette* of January 28th, 1916, and July 13th, 1916, and received the C.M.G. in 1915.

Lieut.-Colonel John Osburne, R.A.M.C. (retired), died recently in County Kildare, aged 64. He became L.R.C.P. and S.Edin. in 1880, and entered the army as surgeon on February 5th, 1881, becoming Lieut.-Colonel after twenty years' service, and retiring on January 11th, 1902. After retirement he was employed at Galway from 1904 to 1916. He served in the Egyptian war of 1882, was at the battle of Tel-el-Kebir, and received the medal with a clasp and Khedive's bronze star; in the Sudan in 1885, at Suakin, and at the action of Tofrek (clasp); and in the South African war in 1900–01, taking part in operations in Cape Colony and in the Transvaal, and gaining the Queen's medal with three clasps.

Major Arthur Charles Oldham, R.A.M.C. (T.F.), died recently of sunstroke in the Persian Gulf. He was educated at Owens College, Manchester, and in the R.C.S.I. School in Dublin he took the Scottish triple qualification in 1895. Before the war he was in practice at Kidderminster. He took a medical commission in the old Volunteer Force on December 21st, 1898, transferred to the Territorial Force on its organization, and became surgeon-major in the 2nd South Midland (Worcester) Brigade of Royal Field Artillery on July 19th, 1912, with which he went on service in August, 1914, serving throughout the war. After the armistice he served for some time in the army of occupation at Cologne, and about eighteen months ago took an appointment at Bagdad.

Medical News.

THE St. Bartholomew's Hospital and College annual old students' dinner will be held in the Great Hall of the hospital on Monday, October 3rd, at 7 for 7.30 p.m. The chair will be taken by Dr. W. S. A. Griffith. The honorary secretary is Sir C. Gordon-Watson, 82, Harley Street, W.1.

DR. JAMES ARTHUR HARGREAVES of Wetherby, Yorks, has been appointed to the Commission of the Peace for the West Riding of Yorkshire.

DR. CHARLES CAMERON, assistant medical officer of health and divisional tuberculosis officer for the South-Western Division of Glasgow, has been appointed medical superintendent of the sanatorium to be instituted at East Fortune by the South-Eastern Counties of Scotland Joint Sanatorium Board.

THE annual dinner for past and present students of Westminster Hospital will be held on Friday, October 7th, at the Great Central Hotel. Sir Charles Ryall will be in the chair. The usual notices will be sent out early in September. The honorary secretary is Dr. Adolphe Abrahams, 24, Park Crescent, Portland Place, W.

WE learn from *Nature* for August 4th that the main object of Professor Einstein's recent visit to America has been attained, and that the establishment of the medical faculty of the University of Jerusalem is now assured. It is proposed also to establish at an early date an arts faculty, a Jewish faculty, and departments of physics, chemistry, law, and commerce. So far as possible, Hebrew will be the medium of instruction, this being the language spoken by the Jews of Palestine, but no religious or racial tests will be enforced. The university, which was founded in 1918, will be modelled on European and American standards.

THE second Congress of the Association of Gynaecologists and Obstetricians of French-speaking countries will be held in Paris from September 29th to October 1st, 1921. Membership of any French-speaking gynaecological or obstetrical society entitles to membership of the congress. The general secretary is Dr. Brindeau, rue de Grenelle 71, Paris.

THE ceremonies in connexion with the dedication of the new building of the Peking Union Medical College, erected by the China Medical Board of the Rockefeller Foundation, will include an international medical conference during the week commencing September 15th, which will be participated in by medical men from all parts of the world. Among those who have accepted invitations and will be present are Dr. Thomas Cochrane, of London, formerly Principal of the Union Medical College at Peking; Sir William Smyly, of Dublin; Professor R. T. Leiper, of the London School of Tropical Medicine; Professor Tuffier, of Paris; Dr. George de Schweinitz, of the University of Pennsylvania, President-elect of the American Medical Association; and Dr. A. B. Macallum, of McGill University, Montreal.

A BILL for the prevention of venereal diseases is to be introduced by the health authorities in the Japanese Diet in the coming session. It is stated in the official report of the medical examinations for conscription that the number affected with venereal disease was approximately 11,600 out of a total conscription list of 534,800 for the year.

DR. RAGHAVENDRA ROW, M.D., D.Sc., has been appointed first physician to the Jamsetjee Jeejeebhoy Hospital and professor of medicine and therapeutics at the Grant Medical College, Bombay. This is the first time, the *Pioneer* states, that a member of the independent medical profession has been appointed to the post. Dr. Row, who received his medical education at the Grant Medical College and University College, London, was at one time demonstrator of physiology at the first named institution; he has made many contributions to pathology.

THE winter session at the Middlesex Hospital will open on Tuesday, October 4th, at 3 p.m. The introductory address will be delivered by Mr. Gordon Taylor, F.R.C.S., after which the prizes gained during the previous year will be distributed by Sir John Bland-Sutton, Consulting Surgeon to the Hospital. The annual dinner will be held the same evening, at 7.30, at the Trocadero. Dr. Comyns Berkeley will preside. Those wishing to be present at the dinner should communicate as soon as possible with the Secretary-Superintendent of the Hospital.

THE second International Congress of Eugenics is to be held in New York City from September 22nd to 28th, 1921.

AT the June matriculation examination of the University of London there were 210 successful candidates in the first division and 1,308 in the second division; 34 candidates obtained the supplementary certificate in Latin.

A DISPATCH from Helsingfors reports that the Health Commissioner informed the Pan-Russian Health Congress in Moscow, on June 21st, that cholera was raging in the southern and middle provinces of Russia.

ON June 18th graduates of the University of Pennsylvania paid a tribute to the late Dr. Joseph Leidy, who at one time was professor of anatomy at the institution, when they unveiled a bronze statue in his memory at the University's medical laboratory building.

THE thirty-first annual meeting of the American Electrotherapeutic Association will be held in Washington from September 7th to 19th. Dr. Byron S. Price is president, and Dr. A. Bern Hirsh, 71, West 94th Street, New York, secretary.

THE American Red Cross has held successful exhibitions in child and infant welfare at Lille, Roubaix, and Tourcoing. These three cities form practically one industrial group, and are still seriously crippled by the damage done during the period of German occupation.

DURING the present financial year three new public sanatoriums for tuberculosis are to be established in Japan; when these have been completed there will be in all ten public tuberculosis sanatoriums established under the regulations for the prevention of tuberculosis.

A FEW months ago the Spanish Government withdrew the privilege of practising in Spain from foreign medical practitioners. Owing mainly to the efforts of Professor Recasens and Professor Maranon the privilege has, according to the *Paris Médical*, been restored to French medical practitioners, but information is lacking as to whether this will apply to practitioners of other nationalities.

THE Second International Congress of Comparative Pathology will take place at Rome on September 20th.

A FRANCO-POLISH medical congress will be held at Warsaw on September 15th to 19th.

THOUGH the Dental Act, 1921, has received the Royal assent, the additional registrations for which it provides cannot be made until the Dental Board the Act directs should be set up has been constituted.

ON November 5th the Faculty of Medicine of Montpellier will celebrate the seventh centenary of its foundation by a banquet and other festivities.

THE *Nederlandsch Tijdschrift* relates that the students and faculties of the Swiss universities are soliciting funds for founding a sanatorium at Leysin for the benefit of tuberculous students and professors of any country.

THE *Riforma Medica* announces that the clinical institutes of Milan are to be merged henceforth in the medical school of the University of Pavia. There are several post-graduate institutes in Milan, including one for occupational diseases.

THE late Mr. John Dyer of Swansea, who left net personalty of £49,954, has bequeathed £4,000 to the Swansea General and Eye Hospital, £1,000 to the North Devon Infirmary, Barnstaple, and £500 each to the Swansea Infirmary for the Blind and the Yeatmen's Hospital, Sherborne.

A NEW cottage hospital established at Chirk, Denbighshire, mainly, as we understand, through the exertions of Dr. John D. Lloyd, was opened by Sir Napier Burnett on August 4th. The hospital, which is of brick, rough cast, has wide and commanding views of the Welsh and Shropshire hills. There are eighteen beds, three of which are for private patients. Lady Trevor, of Brynkinalt, has generously presented an up-to-date operating theatre; Miss Cheetham has endowed a bed to the memory of Mr. Barnes; a cot has been endowed, with the promise of another. In the initial stages £4,000 was raised locally, and this sum was covered by the joint committees of St. John and the British Red Cross, which have since made further liberal gifts. Ifton and Brynkinalt colliery employees contributed £1,073—£1 per head—and the Collieries Relief Society gave £500, as well as £30 towards a memorial tablet presented to the hospital in memory of the 125 men of these collieries who laid down their lives in the war.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.

2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.

3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

"IATROS," who is in active practice but whose nights and week-ends are his own, asks whether it would be possible for him, under these circumstances, to obtain the diploma in ophthalmic medicine and surgery of the Conjoint Board. He wishes information as to the routine of work, the textbooks, and the type of practical work required at the first part of the examination.

TOBACCO HABIT.

"MEDICUS" writes that if "Victim" applies silver nitrate solution to his throat he will find tobacco abominable and gladly refrain from using it. Repeat as required. Put all tobacco, etc., out of sight.

INCOME TAX.

"W. G. R." sold his practice, but not his book debts, last year; the inspector of taxes claims payment of tax on the amount of book debts paid to "W. G. R." since the sale of the practice. What action should be taken?

*** The inspector's attitude seems to be founded on a misunderstanding of the "cash receipt" method of calculating liability. That method has been accepted by the Board of Inland Revenue on the ground that in the case of a well-established practice, the "cash receipt" income is equivalent to the—theoretically more correct—"booked" income less an allowance for bad debts. In other words "W. G. R." has already paid tax on the income from his practice, and he is not now assessable for what he is realizing from the book debts. It is not clear on what "income" the inspector proposes to raise an assessment, seeing that our correspondent's professional work has ceased. "W. G. R." might lay the facts before the Secretary, Inland Revenue, Somerset House, in writing, or alternately repudiate liability, and if and when a notice of assessment is received give formal notice of objection and appeal to the local or special commissioners of income tax.

"A. M." is assessed under Schedule E for his remuneration as house-surgeon, and has been refused any deduction for the expense of purchasing professional books or subscribing to professional societies.

*** We think this refusal unjustifiable. A practitioner's medical library is part of his professional equipment, and we consider a reasonable expenditure on its *maintenance* at a normal standard as allowable on the ground that it is incurred wholly, exclusively, and necessarily in the performance of the duties of the office.

"H. F." has received a letter from the local official declining to allow the expense incurred in using a pony and trap for his attendance at the hospital as radiologist to the Infirmary and War Pensions Committees. Our correspondent is crippled, and the use of a conveyance is necessary for him.

*** The inspector's action appears legally correct. The emoluments concerned are chargeable under Schedule E, and it has been held in cases decided in the courts that deductible expenses must be incurred *in* the performance of the

duties, not in travelling to the place where they are employed. This case supplies another instance where the distinction on this point between Schedule D and Schedule E creates a distinct hardship.

A GRAVEYARD SITE.

"MEMBER of twenty-five years' standing" is anxious to purchase a piece of land in a main road in a county town, but he now understands it was used as a burial ground fifty years ago. He asks if there would be any objection to the erection of a building or dwelling-house thereon.

*** It would assist in replying to this question if we had been told for how long a period the ground had been used as a burial ground and what is the nature of the subsoil. Assuming that it has been under cultivation for the past fifty years, there would appear to be no objection, apart from sentiment, to the erection on it of a building or dwelling-house.

LETTERS, NOTES, ETC.

THE DYNAMOMETER AS A TEST OF FATIGUE.

DR. E. A. C. SWAINSON (Stafford) writes: Sir Thomas Oliver's paper on industrial hygiene mentions the dynamometer as a method of testing "fatigue." Twenty-seven years ago, foolishly perhaps, I used to play with heavy-weight dumb-bells. The following facts, as regards myself, were forced on my observation: Muscular strength is low on rising in morning and lower after a cold bath. It rises considerably in the forenoon, reaches its maximum at 5 or 6 p.m., and slightly diminishes in the evening. A long bicycle ride in the afternoon made no perceptible difference. I remember lifting for the first time, to my surprise, a new and particularly solid specimen after coming back tired from a ride of at least forty miles. Note the difference: low power in morning, fresh after a bath; high power in afternoon when tired. Dynamometer readings would probably work out in the same way. Some years afterwards a review published in this JOURNAL of a small work by an American professor gave equivalent results. I do not think, therefore, that one or two grips of the machine give much, if any, indication of fatigue. While on the subject of grip, we used to be taught that a grip *slightly* in favour of the left hand meant defect of the right side, except in left-handed persons. This presumes that the right hand is usually about 5 lb. better than the left. I doubt it. My own left-hand average is as good as the right, and I have frequently found this to be the case in others.

IONIC MEDICATION IN SEPTIC WOUNDS.

DR. CHARLES W. HAYWARD (Hatch End, Middlesex) writes to express the opinion that the value of ionic medication for the cleansing of septic wounds is not as much appreciated as it deserves. He writes: The action of salt solution upon infected wounds, when the electric current is passed through, warrants all the praise given by your correspondent. In 1911 I reported cases treated in this manner with marked success, and one of them may suggest to your correspondent methods which will be useful to him and his patients. I was treating in hospital a case of neglected septic hand, where extension had taken place necessitating amputation, with reamputation at the elbow. Further complications threatened, as there were sinuses about seven to eight inches upwards along the humerus. I daily placed the stump in a deep vessel of salt solution up to the armpit, and in each sinus I placed a long hip-probe. The salt solution entered the two sinuses, and the probe conveyed the current the full length of each sinus. Within a few days the discharge from the sinuses rapidly diminished, the whole stump cleared up, and satisfactory healing took place. This process has also been followed in cases of suppurating sinus after appendicitis, as well as other cases, and it has never failed to produce excellent results. I strongly recommend surgeons to follow up this line of treatment.

A TALL TALISMAN.

In this column on March 19th, p. 448, was published under the above title a communication from an I.M.S. officer giving some account of a circular issued in all seriousness by a native firm in Calcutta, advertising a "Talisman" which they manufacture. We had supposed that the foolishness of the claims made would have been obvious, and therefore our comments were very brief. It appears, however, that we were mistaken, for the firm interested has reprinted the note as a handbill, with this introduction: "The following is the full text of the review of our worldwide 'Talisman' published in the BRITISH MEDICAL JOURNAL, London, of the 19th March, 1921." A medical correspondent in India, who sends this circular, expresses the opinion that the proprietors are trying to gull their fellow-countrymen into believing that their so-called wonder worker "has the approval and recommendation of one of the widest read medical journals in the world." "The ridicule," he writes, "in your few words of comment was too subtle for the average Indian to appreciate in a foreign language." "India," he continues, "seems to abound in patent medicine concerns (often, I regret to say, adopting English or American names) which flood the country with their pernicious advertisement literature."

THE GATÉ-PAPACOSTAS REACTION.

CAPTAIN W. C. SPACKMAN, I.M.S. (Dharmsala, Punjab), writes: The Gaté-Papacostas "formol-gel" reaction is not specific for syphilis. It is given by kala-azar, with this most important distinction, that the serum coagulates in a few seconds, whereas in syphilis twelve to forty-eight hours are required. Moreover, the clot is a hard white one, not mildly gelatinous or semitransparent. I suggest to tropical disease workers that the reaction may be strongly given in trypanosomiasis. I have not as yet had time to see if the reaction in kala-azar is modified by injections of antimony tartrate during the cure of the disease.

TREATMENT OF WHOOPING-COUGH.

"ASSISTANT" writes: I have read "Country Doctor's" letter (p. 224) with regard to the treatment of whooping-cough with much interest. May I send an account of the routine treatment at the Bermondsey Medical Mission which has been very successful? In all cases the vomiting and whooping have stopped in fourteen days, and in many cases in a week. The treatment is as follows: (1) The bowels are kept open with syrup of senna, dose according to age. (2) The diet is light and nourishing, and no meal is taken after 5 p.m. This restriction lessens the attacks of coughing during the night. (3) The chest is rubbed back and front nightly with soap liniment, diluted with olive oil for very young children, as they have a tendency to a "liniment rash." (4) We keep the following stock mixture made up:

℞ Alum	ʒ ss
Vin. ipecac.	ʒ jss
Glycerin	ʒ ss
Aquam anethi ... ... ad	ʒ iij

(Dose, ʒ ij four-hourly for a child of 6 years.)

(5) Virol ʒ ss to ʒ j is given three times a day after meals. This treatment may sound rather old-fashioned, but it is most efficacious. Our patients are drawn from among the poorest in a very crowded district, and all are doing well. They come for inspection once a week.

A BONUS ON SALES.

OUR attention has been drawn to a typewritten letter, clearly a circular though marked "Private," which has been received by a medical man from the proprietors of a disinfectant. The circular opens thus:

> "To provide for the further development of the —— business, additional capital is being raised on £100 Ten Year 8 per cent. Debentures, redeemable at £110, with a bonus on sales of —— for 25 years, secured by a Commission Coupon. Whilst I was placing these Debentures with personal friends, I heard of a medical man who wanted a financial interest in ——. It then occurred to me that other members of the profession who have used —— might possibly wish to secure a similar interest. I wrote to a few of our clients, and was surprised at the number of applications received. As you might possibly be interested, I would gladly send you full particulars on hearing from you."

Only one further sentence need be quoted from the circular: "The Debentures need not be in your name, but may be in the name of any member of your family."

We agree that it is objectionable to make a suggestion of this kind to members of the medical profession, and we think it right that readers should be warned to be on their guard in dealing with any proposal of this sort that may reach them through the post.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 26, 27, 30, 31, 32, and 33 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 28, 29, and 30.

THE appointment of a Medical Referee under the Workmen's Compensation Act, 1906, for the Walsall County Court in Circuit No. 25, is vacant. Applications to the Private Secretary, Home Office, by August 27th.

THE appointments of certifying factory surgeons at Llanwrtyd Wells (Brecon) and Southwell (Nottingham) are vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line...	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.